Consumed with Consumption:
the Impact of Friendship on Consumer Self-control

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Eline de Vries
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Chapter 1

Friendship and Consumer Self-control: An Introduction

Consumer self-control is as important as it is problematic in today's consumer society filled with consumption temptations. Four out of ten British women try to avoid the high street when sales are on, unable to resist bargains. Another 15 per cent of them report skipping their lunch breaks, to stay away from temptations by shops and restaurants ("Addicted to Shopping" 2009). Clearly, the continuous proximity of consumption temptations poses a serious challenge to our self-control (Faber and Vohs 2011; Hoch and Loewenstein 1991). Confronted with consumption impulses that are difficult to resist, we all, at times, get seduced into making unnecessary purchases or consuming more of that tasty snack than potentially healthy. Although not immediately problematic, ultimately, such difficulties with controlling consumption impulses have negative consequences. Prevalence estimates of *compulsive buying* for instance, vary around 12 percent of the general population (Dittmar 2005; Faber and O'Guinn 1992), while over 60 percent of the adults in the US are overweight (Centers for Disease Control and Prevention 2010). Such instances of overeating and spending have been associated with a variety of social, health and financial problems, ranging from mild to – literally – deadly severe (Dietz 1998; Faber and O'Guinn 2008; Friese, Hofmann and Wiers 2011; Rook 1987; Stein and Colditz 2004; Zhang and Shrum 2009). Hence, these numbers indisputably show that many of us could use some help resisting consumption temptations.

When in need of help, the first persons we are generally inclined to turn to are our friends. Friends, and especially the friendships we have with them, have been shown to be beneficial for a wide range of topics (including mental and physical health; Wilkinson 1999). But what means friendship for consumer self-control? Is friendship as beneficial for self-control as it is considered beneficial in general? Is there truth in "*I get by with a little help from my friends*" (Lennon and McCartney 1967) within consumer self-control? And if so, by what process?

Using a multi-method approach with methods ranging from behavioral experiments to functional magnetic resonance imaging (fMRI), the aim of the present dissertation is to shed more light on the impact of friendship on consumer self-control. In the remaining part of this first chapter, I will elaborate on friendship and consumer self-control and introduce the other concepts that are studied in this thesis. The chapter ends with an outline of the dissertation.

1.1 FRIENDSHIP

To study the impact of friendship on self-control, we first need to know what exactly friendship is. Friendship has been defined as a *close*, intimate, mutual relationship with a same-sex peer that is distinctly different from other types of social interaction. This definition of friendship by Sullivan (1953) is compatible with the way Clark and colleagues (Clark, Dubash, and Mills 1998; Clark and Mills 1979; Clark, Mills, and Powell 1986) conceptualize friendship. According to these authors, social relationships can be divided into communal and exchange relationships. Whereas exchange relationships center around the specific benefits that members give and receive from each other, communal relationships are characterized by an emphasis on global needs and the general concern for each other's welfare (Clark et al. 1998). As such, they consider the friendship between two close friends a strongly communal relationship. Relationships with coworkers, acquaintances and strangers in contrast, score increasingly lower on communal relationship strength. Being less communal in nature, these latter relationships are gradually more inclined towards exchange relationships (Clark et al. 1998).

In sum, friendship may be defined as a close, intimate, mutual relationship with a same-sex peer that is strongly communal in nature (Clark et al. 1998; Sullivan 1953). Now friendship has been defined, I will turn to the other central concept

within this dissertation: consumer self-control. The following section will contain a short overview of the relevant literature on consumer self-control and will answer questions as: What *is* self-control? And, what processes are *influencing* it?

1.2 CONSUMER SELF-CONTROL

Over the years many attempts have been made to fathom the capacity of humans to exert self-control, and why we all at times fail at it. Hoch and Loewenstein (1991) were one of the first within the field of consumer research to address this problem and have been very influential with their conceptualization of self-control as a psychological conflict between desire and willpower. Currently, capacity based approaches to self-control fulfill a dominant role within consumer self-control literature.

1.2.1 The Strength Model of Self-Control

According to capacity based approaches to self-control, self-control is a finite resource that limits consumers' capacity to inhibit impulses (Baumeister and Heatherton 1996; Fishbach, Friedman, and Kruglanski 2003; Metcalfe and Mischel 1999). Of these capacity based approaches is the strength model of self-control by Baumeister and colleagues (Baumeister et al. 1998; Baumeister and Heatherton, 1996; Baumeister, Vohs, and Tice 2007; Muraven and Baumeister 2000; Vohs and Heatherton 2000) the most notable in the consumer sphere. It conceptualizes self-control analogous to a muscle. Like a muscle that requires strength and energy to exert force, acts of self-control also require strength and energy, constituting the self-regulatory resources (or 'inhibition strength' in the present dissertation) available to inhibit dominant impulses. However, similar to a muscle that gets fatigued after a period of prolonged use, self-regulatory resources also decrease after use, a state known as ego depletion. Hence, the exertion of self-control in previous occasions has consistently been shown to lead to impaired self-control in subsequent self-control demanding situations (Baumeister et al. 1998; Baumeister et al. 2007; Finkel et al. 2006; Hagger et al. 2010; Heatherton and Vohs 1998; Muraven, Tice, and Baumeister 1998; Vohs et al. 2008). For instance, participants that were instructed not to think of a white bear and as such needed self-control to actively suppress their impulse to think of a white bear, were

later inclined to spend more money compared to participants that had not recently used their self-regulatory resources (Vohs and Faber 2007).

1.2.2 Two Factor Theories of Self-Control

Besides the (lack of) self-regulatory resources that we have at our disposal to suppress or override consumption impulses, also the strength of the consumption impulses themselves are believed to be of influence on self-control. Although the idea that consumer self-control is determined by two opposing forces is not new (Hoch and Loewenstein 1991), in recent years there is an increased call to no longer neglect the other force in self-control research and to also take *impulse strength* into account (Friese et al. 2011; Schmeichel, Harmon-Jones, and Harmon-Jones 2010).

As a consequence, self-control in the consumption domain has the last couple of years increasingly been conceptualized as a tug-of-war between two competing forces (Friese et al. 2011; Schmeichel et al. 2010) rather than a single strength. Impulse strength, on the one hand, is thought to be a function of the sensory-spatial proximity of (consumption) temptations (Hoch and Loewenstein 1991; Dhar and Wertenbroch 2012) and expressed through – largely – non-deliberative action (Friese et al. 2011; Schmeichel et al. 2010). A consumer may feel a strong impulse to consume, for instance, when confronted with freshly baked pastries attractively displayed at the entrance of a bakery. Inhibition strength, on the other hand, captures the self-regulatory mechanisms involved in suppressing or overriding salient (consumption) impulses. It typically involves deliberative, effortful, thought and action in the service of curbing the behavioral expression of the impulse (Friese et al. 2011; Schmeichel et al. 2010). One may feel the strong urge to buy and consume the pastries, but may refrain from doing so after remembering one's good intentions to keep to a healthy food regimen.

As long as both forces are in balance, a homeostatic state of self-control exists (Friese et al. 2011; Schmeichel et al. 2010). By implication however, a state of self-control failure ensues when either impulse strength increases and/or inhibition strength decreases (Schmeichel et al. 2010). It is under these conditions that consumers may give in to consumption impulses and engage in forms of self-control failure, like impulse or excessive buying, or the (over)consumption of tasty but unhealthy foods. Conversely, consumer self-control may be enhanced (i.e., homeostasis can be

restored) by either decreasing impulse or increasing inhibition strength (Friese et al. 2011; Hoch and Loewenstein 1991; Schmeichel et al. 2010).

Guided by the strength model of self-control, prior research on self-control has primarily focused on self-control impairment through reductions in inhibition strength (Baumeister et al. 1998; Baumeister et al. 2007; Finkel et al. 2006; Hagger et al. 2010; Heatherton and Vohs 1998; Muraven et al. 1998; Vohs et al. 2008). Much less research has been done on factors *increasing* self-control by improving one or both of the forces. Especially research on factors that reduce the strength of consumption impulses has been notably lacking (Friese et al. 2011; Schmeichel et al. 2010). This is especially striking as the numbers on self-control related problems in society clearly indicate that there is a need for ways to foster self-control.

The research described in this dissertation addresses this gap in the current literature and identifies a factor (i.e., the psychological activation of friendship) that increases consumer self-control. In addition to documenting this finding across various manipulations and measures, the current research is unique in that it empirically examines both processes that have been proposed to drive the self-control struggle: it examines the influence of friendship on impulse strength as well as on inhibition strength.

In addition to studying *what* the influence is of friendship on both forces involved in self-control, aim of this dissertation is also to shed light on *how* friendship impacts self-control. To be able to tap into the underlying processes of the impact of friendship on self-control, I turned to the literature on factors that have been shown to influence self-control and as such may be potential mediators in the friendship effect. Specifically, these factors include: consumers' capacity to identify self-control conflict, their capacity to actually implement self-control and their processing style. In the following part of this introduction, I will provide a short overview of the relevant literature on these factors, to show how this literature helps revealing the processes underlying the friendship effect on self-control.

1.2.3 The Two Stage Model of Cognitive Control

The two stage model of cognitive control (Inzlicht and Gutsell 2007; MacDonald et al. 2000; Myrseth and Fishbach 2009) proposes that there are two processes that together determine one's capacity to inhibit (consumption) impulses: conflict identification and control implementation. C*onflict identification* is a person's capacity to recognize

conflict between desires or short-term gratifications and long-term self-control goals, whereas *control implementation* is the capacity of a person to actually implement the controlled response while suppressing the incompatible impulse (Hedgcock, Vohs, and Rao 2012; Inzlicht and Gutsell 2007). Failing to recognize the conflict between the desire to purchase (yet another pair of) shoes versus keeping a healthy budget, would be an example of impaired conflict identification, whereas an example of impaired control implementation would be if consumers recognize the tension between their spending urges and budget goals, but nonetheless buy the shoes (Hedgcock et al. 2012). Conversely, inhibition strength may be enhanced by improving one's capacity to identify conflict and/or capacity to implement self-control (Hedgcock et al. 2012; Inzlicht and Gutsell 2007; MacDonald et al. 2000; Myrseth and Fishbach 2009).

Neuroimaging findings show that consumers' capacity to identify conflict and to implement control can reliably be distinguished from each other as they rely on two separate neural systems (MacDonald et al. 2000). Whereas consumers' conflict identification is related to activation in the anterior cingulate cortex (ACC; Botvinick et al. 1999; Hedgcock and Rao 2009), their ability to implement control is related to activation in the dorsolateral prefrontal cortex (DLPFC; MacDonald et al. 2000; Liddle, Kiehl, and Smith 2001). The ACC is a brain area known as the conflict detection center in the brain, whereas the dorsolateral prefrontal cortex (DLPFC) is recognized as the brain area engaged with the actual implementation of self-control (Hedgcock et al. 2012; Inzlicht and Gutsell 2007; Knoch and Fehr 2007; Liddle et al. 2001). For instance, reduced activation in the ACC has been associated with worse performance on the Stroop Task (Inzlicht and Gutsell 2007). In a Stroop Task, stimulus words are presented in font colors that do not correspond to the semantic meaning of the words (e.g., 'red' presented in blue font). As such, performing well on the Stroop Task (i.e., correctly naming the font colors), requires identification of the conflict between one's impulse to respond to the semantic meaning of the words versus naming the actual font colors (Inzlicht and Gutsell 2007; Stroop 1935).

In conclusion, if friendship enhances consumers' self-control, literature on the two stage model of cognitive control may provide insight in how friendship may have this effect. According to this literature, friendship may enhance inhibition strength by improving consumers' conflict identification, control implementation, or a combination of both. That is, friendship may increase activation in one or both of the following brain areas: the ACC and/or DLPFC respectively.

1.2.4 Processing Styles

Construal level theory proposes that people can look at or attend to the same object or event at different levels of abstraction (Förster, Liberman, and Shapira 2009; Trope and Liberman 2003, Trope, Liberman, and Wakslak 2007). A classic example is one of the forest and the trees. When confronted with a collection of trees, one can either attend to every single tree or perceive the entire forest (Navon 1977). The former indicates a local processing style (or low-level construals; a focus on local, concrete or subordinate features), whereas the latter is an indication of a global processing style (or high-level construals; a focus on the global, abstract or superordinate features of an object or situation; Trope and Liberman 2010). Research has shown that sensitivity to concrete features promotes succumbing to consumption temptations, whereas resisting temptations and exercising effective self-control is generally facilitated by the capacity to transcend the lure presented by the here and now and focus on more abstract and global characteristics (Fujita et al. 2006; Schmeichel, Vohs, and Duke 2011). Whether consumers give in to temptations or exert effective self-control, thus (partly) depends on their processing style. More specifically, activation of a global versus local processing style has been shown to increase preference for apples over candy bars (Fujita and Han 2009), decrease positive evaluations of consumption temptations and to reduce preference for immediate over delayed consumption (Fujita et al. 2006). Low levels of self-control in contrast, have been associated with a local processing style (Bruyneel and Dewitte 2012; Wan and Agrawal 2011).

The influence of consumers' processing styles on self-control is particularly relevant as friendship may influence consumers' processing styles. That is, the conceptualization of friendship as a strongly communal relationship (Clark et al. 1998), suggests that friendship can be primarily characterized by a focus on abstract and global values and concerns. As a focus on abstract and global features is typically known as a global processing style (Trope and Liberman 2010), (the psychological activation of) friendship may facilitate a global processing style and as such enhance consumers' self-control.

1.3 OUTLINE OF DISSERTATION

In this dissertation, I aim to provide insight in the impact of friendship on consumer self-control, by examining the influence of friendship on both forces involved in effective self-control (i.e., impulse versus inhibition strength). Moreover, I try to unravel the underlying process of the friendship effect, by examining consumers' capacity to identify self-control conflict, their capacity to actually implement self-control and their processing style as potential mediators. In the following sections I will characterize the consumers central to this research and provide a preview of the empirical chapters. For a visual display of the relationships between the concepts examined in this thesis and the different chapters, see Figure 1.1

1.3.1 Consumers (Chronically or Temporarily) Low in Self-control

Throughout this dissertation, the effect of friendship on self-control was expected to be particularly pronounced with consumers either chronically or temporarily low in self-control, as the potential beneficial impact of friendship on self-control can plausibly be the largest if self-control is (temporarily or chronically) impaired. Consumers whose self-control is not (temporarily or chronically) impaired, likely possess sufficient self-control to resist consumption temptations, obviating the role of friendship.

Hence, in this dissertation I alternately examine three types of consumers that are (chronically or temporarily) low in self-control: compulsive buyers, depleted consumers and consumers with a local processing style. Note that all compulsive buyers studied in this dissertation were identified in the general population and that we had no access to information about clinical diagnosis with respect to compulsive buying. However, in line with previous literature, the compulsive buyers consistently showed a lack of control over their (buying) impulses (Faber and O'Guinn 2008; Ridgway, Kukar-Kinney, and Monroe 2008), suggesting that they are chronically low in inhibition strength. Depleted consumers in addition, are consumers depleted of their self-regulatory resources. Following the strength model of self-control (Baumeister et al.1998; Baumeister et al. 2007), these consumers are considered temporarily rather than chronically low in inhibition strength, and as a consequence, experience temporary difficulties with inhibiting consumption impulses. This temporarily heightened sensitivity to consumption temptations also holds for consumers induced

with a local processing style. Their temporary focus on local, concrete or subordinate features of objects or events temporarily decreases their capacity to inhibit consumption impulses (Fujita et al. 2006). Consequently, I consider compulsive buyers, depleted consumers and consumers with a local processing style as being exemplar of consumers (chronically or temporarily) low in self-control.

1.3.2 Chapter 2: Friendship & Impulse Strength

In the first empirical chapter, Chapter 2, I introduce friendship as a factor that increases consumer self-control. Across four experiments, I show that consumers are better able to exert self-control (i.e., are less inclined towards impulsive consumption) when the psychological construct of friendship is activated. I document this finding among consumers in general and find that the effect is particularly pronounced for consumers chronically or temporarily low in self-control (i.e., compulsive buyers and depleted consumers respectively). I demonstrate the effect across various friendship manipulations (including the physical presence of a close friend) and across several manifestations of consumer self-control failure (impulsive spending, buying and candy consumption). Moreover, mediation analyses show that the beneficial effect of friendship is driven by friendship reducing the strength of consumption impulses. As such, Chapter 2 provides evidence that friendship improves the *impulse strength* side of the self-control struggle.

1.3.3 Chapter 3: Friendship & Inhibition Strength

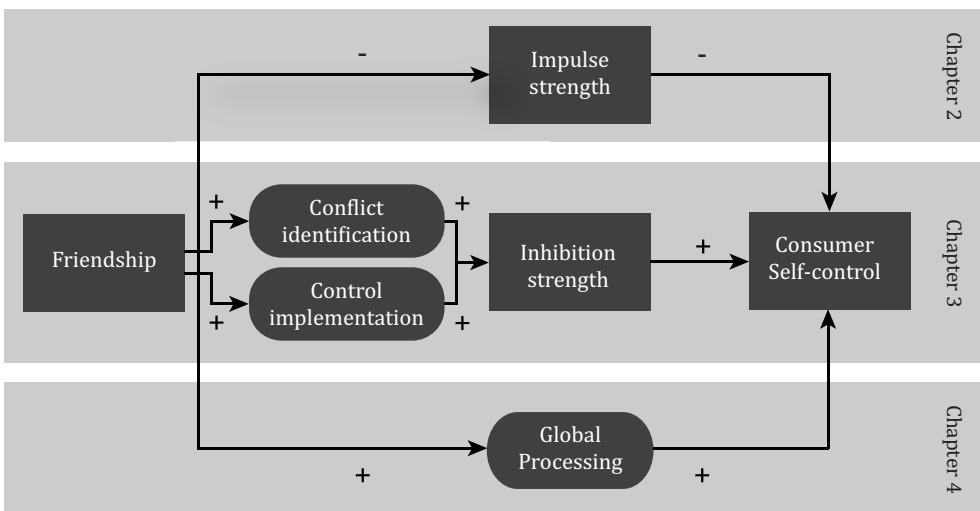
In Chapter 3, I zoom in on the role of the second force involved in maintaining or restoring consumer self-control: inhibition strength. Using a validated measure of consumers' inhibition strength (Go/No-go task; Batterink, Yokum and Stice 2010; Liddle et al. 2001; Newman, Widom and Nathan 1985; Mishra and Mishra 2010; Yechiam et al. 2006), I first show behaviorally that friendship increases consumer self-control by positively influencing the *inhibition strength* of compulsive buyers. Moreover, the first experiment provides preliminary evidence suggesting that the effect of friendship on inhibition strength is caused by an improved capacity to identify conflict and to implement control. Using functional Magnetic Resonance Imaging (fMRI), I continue with studying more directly how exactly friendship enhances inhibition strength. That is, whether friendship enhances activation in the ACC and/

or in the DLPFC (i.e., improves conflict identification and/or control implementation respectively). The results converge with the findings of the first experiment, providing converging evidence that friendship enhances the inhibition strength of consumers (chronically) low in self-control by improving both processes constituting inhibition strength: friendship facilitates conflict identification *and* control implementation.

1.3.4 Chapter 4: Friendship & Global Processing

In the final empirical chapter, I reveal global processing as an (additional) underlying mechanism driving the friendship effect on self-control. More specifically, I show that the psychological activation of friendship induces transcendence from the immediate environment, allowing consumers to see beyond the alluring but subordinate features of consumption temptations. This global processing style, in turn, promotes consumers' self-control. Consistent with the findings in the previous chapters, the friendship effect occurred with low self-control consumers and does not occur when reminding consumers of a far less communal relationship than friendship.

Figure 1.1: Conceptual model describing the impact of friendship on consumer self-control as studied in this dissertation



Chapter 2

Friendship & Impulse Strength*

"I get by with a little help from my friends"

– Lennon and McCartney (1967)

Failures to override consumption impulses lie at the heart of many problematic consumer behaviors (Baumeister 2002; Baumeister and Heatherton 1996; Faber and Vohs 2011; Friese, Hofmann, and Wiers 2011). Consumers may fail to control impulses to eat unhealthy food, drink alcohol, smoke cigarettes (Friese et al. 2011), or fail to resist impulses to buy (Faber and Vohs 2011; Rook 1987). In fact, consumption impulses are regularly perceived as irresistible (Hofmann et al. 2011). Ultimately, difficulties controlling consumption impulses can lead to such adverse consequences as addiction, physical and mental health pathologies, financial debt, and marital discord (Faber and O'Guinn 2008; Friese 2000; Friese et al. 2011; Rook 1987; Zhang and Shrum 2009).

Of course, people typically do not buy, use and discard products and services in a social vacuum. Hence, it is striking to note how little research has directly examined the influence of social relationships on consumer self-control in general, and what the

* This chapter is based on De Vries, Eline L.E., Bob M. Fennis, Debra Trampe, and Kathleen D. Vohs (2013). "With a Little Help from My Friends: Friendship Facilitates Self-Control by Reducing the Strength of Consumption Impulses," working paper, University of Groningen

impact is of friendship on (controlling or failing to control) consumption impulses, in particular. This is especially striking as friendship has been shown to be beneficial for a wide range of topics (including mental and physical health; Wilkinson 1999) and many consumers could use some help resisting consumption temptations.
In the present research, we demonstrated that mere social presence of a close friend may promote self-control in the face of consumption temptations. In addition, we showed that friendship has its beneficial impact on self-control through its impact on experienced impulse strength. Our proposition requires elaborating on two key postulates: one, that impulse strength is directly related to self-control and two, that activating the notion of friendship is directly related to impulse strength of consumption temptations. Both postulates are discussed next.

2.1 IMPULSE STRENGTH IS RELATED TO SELF-CONTROL

Self-control has been likened to a tug-of-war between two competing forces: impulse strength and inhibition strength (Friese et al. 2011; Schmeichel, Harmon-Jones, and Harmon-Jones 2010). Impulse strength is thought to be a function of the sensory-spatial proximity of (consumption) temptations (Hoch and Loewenstein 1991; Dhar and Wertenbroch 2012) and is expressed through – largely – non-deliberative action (Friese et al. 2011; Schmeichel et al. 2010). A consumer may feel a strong impulse to consume, for instance, when confronted with freshly baked pastries attractively displayed at the entrance of a food-market. Inhibition strength, on the other hand, captures the self-regulatory mechanisms involved in suppressing or overriding salient (consumption) impulses and typically involves deliberative, effortful, thought and action in the service of curbing the behavioral expression of the impulse (Friese et al. 2011; Schmeichel et al. 2010). One may feel the strong urge to buy and consume the pastries, but may refrain from doing so after remembering one's good intentions to keep to a healthy food regimen.

As long as both forces remain in balance, a homeostatic state of self-control exists (Friese et al. 2011; Schmeichel et al. 2010). By implication, a state of self-control failure ensues when either impulse strength increases and/or inhibition strength decreases (Schmeichel et al. 2010). It is under these conditions that consumers may give in to consumption impulses and engage in forms of impulsive consumption, such as unplanned or excessive buying, the (over)consumption of tasty but potentially unhealthy foods, or unintentional spending.

Research on self-control failure has overwhelmingly focused on the role of impaired inhibition strength, possibly due to the large volume of studies directly inspired by the strength model of self-control (Baumeister et al. 1998; Baumeister, Vohs, and Tice 2007; Finkel et al. 2006; Hagger et al. 2010; Heatherton and Vohs 1998; Muraven, Tice, and Baumeister 1998; Vohs et al. 2008; Wang et al. 2010). Extending this reservoir of studies, the present research takes a complementary approach and zooms in on the role of the second force involved in maintaining or restoring a state of sufficient self-regulatory functioning: impulse strength. We propose and show evidence demonstrating that psychologically activating the construct of friendship promotes self-control through its impact on the strength of experienced consumption impulses.

2.2 FRIENDSHIP REDUCES IMPULSE STRENGTH

Previous studies on the impact of the presence of others on self-control related behaviors suggest that social presence frequently interferes with successful self-regulation. For example, research suggests that the presence of (a group of) peers may increase incidences of unplanned spending (Luo 2005) and (excessive) alcohol intake (Zhang and Shrum 2009). In addition, the presence of others has been associated with increased impulsive and unregulated food intake (Redd and De Castro 1992). Apart from normative influences that may encourage consumption in the presence of others (Kurt, Inman and Argo 2011; Luo 2005; Zhang and Shrum 2009), merely observing (unfamiliar or familiar) others performing a behavior (such as spending money in a mall or drinking beer) has been proposed as an explanation for the facilitating influence of other consumers on self-control failure (Hoffmann et al. 2011).

Although perhaps counterintuitive, we propose that these (non-deliberative) effects do not necessarily extend to situations where the concept of friendship is activated. In contrast to the previous examples of impulsiveness and excessiveness cued by social presence, there are reasons to assume that when the concept of friendship is activated (e.g., through the real or imagined presence of an intimate friend), restraint and moderation in consumption may be a more likely outcome.

First, research on affirming core values, such as love, belongingness and affiliation has shown that participants who think or write about such values that are dear to them do not show the typical lapse in self-control after self-control exertion, a state known as self-regulatory resource depletion (Schmeichel and Vohs 2009). According

to a recent view proposed by Inzlicht and Schmeichel (2012) such self-affirmation effects on self-control shifts motivation and attention away from the tempting stimulus, thus curbing impulsive desires. Hence, and by implication, we might expect that the activation of friendship renders a consumption temptation a bit bleaker in its presence and consequently will decrease the strength of the associated impulse, thus aiding in self-control.

Second, and particularly germane to the present research, there are studies more directly pointing to the proposition that (reminders of) friendship may reduce the experienced strength of consumption impulses. Specifically, Fitzsimons and Bargh (2003) showed that priming participants with close friends produced behavior in line with the goals associated with those friendships. Importantly, such priming rendered *other* stimuli that were irrelevant to the friend-related goal pursuit less salient. Hence, in the face of friendship, consumption temptations might wane and consequently lose some of their strength. Recent work on goal activation and goal inhibition directly underscores this notion. Liberman and Förster (2005) have shown that activation of one goal simultaneously inhibits activation of concurrent goals. Specifically, the activation of a goal that is inconsistent with a certain temptation has been found to inhibit the mental representation of that temptation (Fishbach, Friedman, and Kruglanski 2003). Hence, to the extent that the actual or imagined presence of a close friend activates (the goal of) friendship, the pull presented by competing consumption temptations may become less salient, and, by implication, impulse strength decreases.

Taken together, we suggest that psychologically activating the notion of friendship promotes consumer self-control by reducing the experienced strength of impulses exerted by consumption temptations. We tested our notions in a series of four experiments.

2.3 PRESENT RESEARCH

In the present research we demonstrate the importance of friendship for consumer self-control by studying three manifestations of consumer self-control failure: impulsive spending, impulsive buying, and unplanned consumption. We start with examining the influence of activated friendship by means of the real presence of a close friend and show that the actual presence of this friend decreases the tendency

to spend impulsively. In the second experiment, we use an alternative procedure to activate the concept of friendship and extend our findings from self-reported impulsive spending to an actual, overt, behavioral manifestation of impulsive consumption, i.e., actual, unplanned, candy consumption. In addition, in this and the next (third) experiment we show that the effect of a friendship reminder on impulsive, unplanned consumption is particularly pronounced under conditions of low temporary (Experiment 2) or chronic (Experiment 3) self-control. Finally, in Experiment 3 and Experiment 4 we also directly address the assumed underlying process driving our effects. Specifically, in Experiment 3 we demonstrate that the impact of friendship on impulsive consumption is mediated by reduced impulse strength. We replicate this mediation in Experiment 4, thus showing converging evidence for our notions.

2.4 EXPERIMENT 1

In the present study we used what is perhaps the most direct manipulation of activating the construct of friendship: We examined the impact of the actual, physical presence of a close friend on impulsive consumption. We expected that the mere presence of this close friend (without her urging or directing the participant in any way) would result in reduced impulsive consumption. Importantly, to rule out the possibility that the expected effects could be attributable to the mere presence of any person rather than to that person being a close friend, our comparison condition in this study consisted of a condition in which participants were in the presence of a stranger. We also included a second comparison condition in which participants were alone.

2.4.1 Participants and Design

One hundred thirty-six female students were initially recruited to participate in the study. We invited only women to participate as women could likely identify themselves better with the shopping situation central to the study than men. The current study was the first study in a sequence of experiments conducted by various researchers. Ten participants who were outliers on several key dimensions (i.e., having values greater than two standard deviations above or below the mean on mood or personality traits; Hair et al. 2009) as well as two participants who could not comply with instructions

due to language deficits and one who failed to complete all measures, were excluded from the analyses. This resulted in a total sample of 123 female undergraduates with a mean age of 19.41 (SD = 1.73) that participated in return for money or partial course credit. The study employed a single factor (activation of friendship: close friend vs. stranger vs. alone) between-participants design. All participants came to the study with a close friend, in order to participate in a series of unrelated studies on social relations and consumer behavior.

2.4.2 Procedure

All participants arrived at the laboratory with a close same-sex friend. After signing an informed-consent form, participants were randomly assigned to one of three conditions. Pairs of friends assigned to the alone condition were split and seated alone, whereas pairs of friends assigned to the presence of close friend-condition were seated together. Pairs of friends assigned to the presence of stranger condition were split and combined with an unacquainted participant from a different pair of friends. It was stressed to participants not to talk to each other and a hidden audio system allowed the experimenter to overhear potential conversations during the experiment. All participants complied with the request and did not talk to each other during the experiment. Thus, participants in both the friend and stranger conditions were in the presence of another person but were not interacting during the experiment.

Participants read a hypothetical shopping scenario that was adapted from Rook and Fisher (1995). Participants were instructed to imagine a situation in which they went to a department store to purchase only a pair of socks but once in the store saw a great looking pair of jeans on sale. Next participants indicated their mood (1 = very negative; 7 = very positive) as a check for unintended effects of conditions on emotions.

As a measure of impulsive spending, participants indicated the amount (in Euros) they were willing to pay for the jeans (Vohs and Faber 2007). As a manipulation check, participants in both the close friend and stranger condition were asked how long (in months) they had known the other person in the room and how well they knew the other person (1 = not at all, 7 = very well).

2.4.3 Results and Discussion

2.4.3.1 Manipulation check

Compared to participants in the presence of stranger condition, participants in the presence of close friend condition indicated they knew the other person on average 49 months longer (M_{friend} = 51.32 months, SD = 42.02 versus $M_{stranger}$ = 2.35 months, SD = 11.65; $t(46) = 7.18$, $p < .001$) and also knew the other person better (M_{friend} = 5.63, SD = 1.26 versus $M_{stranger}$ = 1.40, SD = 1.19; $t(79) = 15.52$, $p < .001$). Hence, the manipulation of the close friend vs. stranger condition was successful.

2.4.3.2 Mood

The presence or absence of another person did not induce unintended effects in terms of mood across conditions ($F < 1$).†

2.4.3.3 Impulsive spending

An one-way ANOVA conducted on willingness-to-pay as a function of condition showed the predicted effect ($F(2,120) = 4.59$, $p < .05$). In line with predictions, post-hoc tests (LSD tests) revealed that participants in the presence of a close friend were willing to pay significantly less for the jeans (M = 46.95 Euros, SD = 15.45) than participants who were either alone (M = 57.32, SD = 16.44, $p < .01$) or in the presence of a stranger (M = 54.02, SD = 15.58, $p < .05$). Participants in the presence of a stranger did not differ in their willingness-to-pay compared to participants in the alone condition ($p = .348$).

The actual, physical presence of a close friend thus reduced consumers' tendency to spend impulsively compared to when they were either alone or in the presence of a stranger. Importantly, the observation that the presence of a stranger did not produce the same effect rules out mere social presence or distraction as alternate explanations.

2.5 EXPERIMENT 2

Experiment 1 suggested that activating the concept of friendship, made salient through the physical presence of a single close friend, reduces consumers' tendency

† As our manipulations neither produced main or interaction effects on mood in the other three experiments reported in the paper, mood will not be discussed further.

to engage in impulsive spending. Experiment 2 aimed to replicate and extend this finding in four ways. First, we extended our sample to include male as well as female participants. Second, we used an different manipulation of the concept of friendship. In this study we used an established mindset activation procedure (Dijksterhuis and Van Knippenberg 1998; Wheeler, Jarvis, and Petty 2001) to remind our participants of friendship. Third, we focused on an actual, overt, behavioral manifestation of impulsive consumption in the form of unplanned candy consumption. Fourth, we assessed the beneficial influence of activating the concept of friendship when situational demands temporarily limit the extent of individual self-control exertion. Following the strength model of self-control (Baumeister et al. 1998; Baumeister et al. 2007; Vohs and Heatherton 2000), we experimentally manipulated self-regulatory resource depletion and examined the influence of friendship within a depletion context on impulsive consumption. We expected reminders of friendship to benefit impulsive consumption particularly when participants were depleted of their self-regulatory resources, as the potential to increase self-control is likely the largest under conditions of low self-control.

2.5.1 Participants and Design

One hundred-nineteen undergraduates were recruited to participate in return for money or partial course credit. We removed the following participants from analyses: four participants who were outliers on several key dimensions (e.g., having values greater than two standard deviations above or below the mean on mood or personality traits; Hair et al. 2009), two who did not comply with instructions (cf. Oppenheimer, Meyvis and Davidenko 2009), and two participants because of missing data. This resulted in a total sample of 111 participants (57.7% male; mean age 20.48 years, SD = 2.30).

The study used a 2 (friendship reminder procedure: reminder of friendship vs. neutral) × 2 (self-regulatory resource depletion: depletion vs. no depletion) between-participants factorial design.

2.5.2 Procedure

Upon arrival at the laboratory, participants signed an informed-consent form and were seated individually in cubicles. The first task involved the friendship reminder

procedure. In this condition, participants described a situation in which they had felt strong friendship with a close friend. Instructions indicated that they should use the following words: *we, together, friendship* and *bond*. In the relationship-neutral (control) condition, participants were asked to describe the manufacturing process of a wooden table, as this process is likely to lack social elements. These participants were instructed to use the words *trees, wood, sawmill* and *truck*.

The next step involved the manipulation of self-regulatory resource depletion (Baumeister et al. 1998). Participants were given a text. In the depletion condition the text was printed in light grey, making it difficult to read and requiring close attention. In the no-depletion condition the font color was black. First, all participants were instructed to cross off all letters *e*. After completing the first sheet, participants in the no-depletion condition continued with this task on the second sheet of paper. Participants in the depletion condition were further instructed to only cross-off letters *e* that satisfied certain conditions (e.g., not followed or preceded by a vowel). Participants in the depletion condition thus had to inhibit the impulse of crossing out every *e* and apply complex rules to work on difficult to read text. Previous research has shown that these conditions produce significant differences in the availability of self-regulatory resources (Baumeister et al. 1998; Fennis, Janssen, and Vohs 2009).

2.5.3 Dependent Measure

Ostensibly as part of a taste test, participants were given a bowl with chocolate candies (M&M's) and were invited to eat as many as they liked in order to evaluate their taste. Unknown to participants, the bowl containing M&M's was weighed before and after each session. The dependent variable of interest was the amount of M&M's participants eaten.

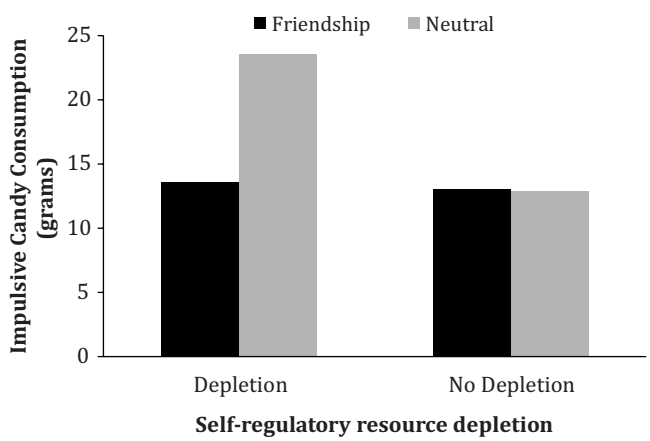
2.5.4 Results and Discussion

A full factorial ANOVA on the amount of M&M's consumed as a function of friendship reminder condition and self-regulatory resource depletion condition showed significant main effects of friendship and depletion. In line with our results from Experiment 1, participants who were reminded of friendship ate fewer M&M's (M = 13.28 grams, SD = 9.19) than participants in the neutral condition (M = 17.85 grams, SD = 14.83; $F(1, 107) = 4.72$, $p < .05$). In contrast, and replicating earlier

findings, participants who were depleted of their self-regulatory resources consumed more M&M's (M = 18.81 grams, SD = 15.01) compared to participants in the no-depletion condition (M = 12.98 grams, SD = 9.38; $F(1, 107) = 6.19$, $p < .05$).

Of particular interest was the observation that the predicted interaction between the friendship reminder procedure and self-regulatory resource depletion also was significant $F(1, 107) = 5.04$, $p < .05$). Analysis of the simple main effects showed that the effect of being reminded of friendship on M&M consumption was significant for depleted participants only. That is, resource depleted participants exposed to the friendship reminder procedure consumed significantly fewer M&M's (M = 13.61 grams, SD = 10.58) than depleted participants who were not reminded of friendship (M = 23.60 grams, SD = 16.99; $F(1, 107) = 8.62$, $p < .01$). For non-depleted participants, in contrast, the friendship reminder procedure did not affect the amount of M&M's consumed ($M_{friendship}$ = 13.06, SD = 8.29; $M_{neutral}$ = 12.90, SD =10.68, $F < 1$; Figure 2.1).

Figure 2.1: Impulsive candy consumption as a function of friendship activation procedure and self-regulatory resource depletion



The current results add to the generalizability of our findings by assessing impulsive, overt behavior supplementing the self-report measure used in Experiment 1. In line with previous research (Vohs and Heatherton 2000), participants who were

depleted of their regulatory resources consumed more candy than their non-depleted counterparts. Importantly and consistent with our hypothesis, our friendship reminder procedure affected consumption levels such that depleted participants ate significantly less candy than their non-reminded counterparts. Note that this effect did not require the actual presence of a close friend, nor him/her doing or saying anything in particular, but was observed by merely reminding our participants of a friendship. In contrast, reminding non-depleted participants of a friendship was inconsequential in influencing consumption, as these participants likely possessed sufficient resources for effective self-control, obviating the role of friendship.

The effect of friendship on impulsive consumption thus seems to be particularly pronounced for consumers (temporarily) prone to self-control failure. The next two studies directly tap into the underlying process proposed to drive the friendship effect. That is, in Experiments 3 and 4 we assessed the role of impulse strength.

2.6 EXPERIMENT 3

Goal of the third experiment was to provide process evidence as to why being reminded of a friendship aids self-control. We hypothesized that the effect is driven by the strength of consumption impulses. Thus, we predicted that we would replicate friendship's helpful effect on self-control and test whether impulse strength mediates this effect.

Furthermore, extending the results of Experiment 2, which showed the effect of friendship on impulsive consumption for consumers with temporary self-control impairment, Experiment 3 tested whether the effect generalizes to consumers chronically low in self-control. To this end, we focused on individuals identified as compulsive buyers. Their consistent lack of control over buying impulses makes these consumers chronically, rather than temporarily inclined towards self-control failure (Faber and O'Guinn 2008; Faber and Vohs 2011; Ridgway, Kukar-Kinney, and Monroe 2008). As a consequence, we expected compulsive buyers to experience powerful buying impulses and relatively high buying intentions when confronted with consumption temptations. If our hypothesis is correct that being reminded of a friendship aids in self-control through weakening the impulse strength evoked by these temptations, then compulsive buyers' buying intentions should drop when they

imagine being in the presence of a close friend compared to when they imagine being alone. Moreover, the impact on buying intentions should be mediated by a reduction in experienced impulse strength.

2.6.1 Participants and Design

Forty-two female undergraduate students participated in exchange for a candy bar. One participant that did not comply with experimental instructions due to language difficulties was excluded, leaving a final sample of 41 participants (mean age 19.83 years, SD = 1.87). The study used a single factor (friendship: presence of close friend vs. alone) between-participants design.

All participants had previously been identified as compulsive buyers. A preliminary test (n = 91 female undergraduate students, mean age 19.74 years, SD = 3.46) administered the Compulsive-Buying Index, an established and validated measure to assess chronic tendencies to engage in compulsive buying (Ridgway et al. 2008). The instrument consists of six items rated on a 7-point scale (1 = strongly disagree/never, 7 = strongly agree/very often). Sample items include "Others might consider me a 'shopaholic,'" "I buy things I did not plan to buy," and "I consider myself an impulse purchaser." A composite index of compulsive buying tendency ($\alpha = .75$) was created by summing scores on the items, with higher scores indicating a stronger tendency for compulsive buying (scores ranged from 8 to 42). Following recommendations by Ridgway et al. (2008), we classified participants as compulsive buyers if they met or exceeded the cut-off score of 25.

2.6.2 Procedure

After signing an informed-consent form, participants were seated individually in cubicles. They received a booklet, randomly exposing them to one of two hypothetical shopping scenarios. Similar to Experiment 1, participants were asked to imagine a situation in which they would go to a department store to purchase a pair of socks and saw a great looking pair of jeans on sale (Rook and Fisher 1995). Participants were either instructed to imagine being alone in the store (alone condition) or in the presence of a close friend (close friend condition). After completing the dependent measures (below), participants indicated the extent to which they imagined themselves in the scenario (1 = not at all, 7 = very strongly).

Survey studies on compulsive buying suggest that compulsive buyers may refrain from buying in the presence of familiar others, because they feel ashamed for their behavior (Friese 2000; O'Guinn and Faber 1989). To rule out the possibility that the predicted effects might be caused by feelings of shame induced by the presence of a friend, participants were asked how ashamed they would feel about purchasing the jeans (1 = not at all, 7 = very much). As a manipulation check, all participants were asked to indicate on 7-point scales to what extent they felt alone and also in the presence of another person during the imagined shopping situation. In addition, participants in the presence of close friend condition were asked to indicate their agreement with the statement: "The relationship between you and your friend is very close" (1 = totally disagree, 7 = totally agree).

2.6.3 Dependent Measures

2.6.3.1 Experienced impulse strength

The strength of participants' buying impulse was measured with the following four statements developed by Luo (2005), using a scale ranging from (1) strongly disagree to (7) strongly agree: "I experienced a number of sudden urges to buy," "I wanted to buy things even though they were not on the shopping list," "I had strong urges to make impulsive purchases,", "I felt a sudden urge to buy." The average of these items ($\alpha = .83$) was used as an index of experienced impulse strength.

2.6.3.2 Buying intention

Participants were then asked to rate the likelihood that they would buy the pair of jeans (1 = not at all likely, 7 = very likely).

2.6.4 Results and Discussion

2.6.4.1 Manipulation checks

Participants in the presence of close friend condition felt less alone ($M = 3.27$, SD = 1.49) than participants who imagined being alone ($M = 4.68$, SD = 1.64, $t(39) = 2.90$, $p < .01$). Participants in the presence of close friend condition agreed more with feeling the presence of another person ($M = 3.64$, SD = 1.71) than participants in the alone condition ($M = 2.16$, SD = 1.34, $t(39) = -3.05$, $p < .01$). In addition, an one-sample t-test using the scale's mid-point as a benchmark confirmed that participants in the

presence of a close friend condition perceived the relationship with their friend as close (M = 4.86; SD = 1.91; $t(21) = 3.35$, $p < .01$). The manipulation of the presence of a close friend can thus be considered successful.

Independent-samples t-tests showed that there was no difference between conditions in the extent to which participants imagined themselves in the scenario ($t < 1$).

2.6.4.2 Shame

No difference related to shame existed between participants in the presence of a close friend (M = 1.86, SD = 1.08) and alone condition (M = 1.47, SD = 0.84, $t(39) = -1.27$, NS). An alternative explanation in terms of shame can thus be ruled out.

2.6.4.3 Experienced impulse strength

An independent-samples t-test on experienced impulse strength showed that participants who imagined the presence of a close friend in the store, experienced a weaker buying impulse (M = 4.98, SD = 1.12) than participants who imagined themselves being alone (M = 5.68, SD = 0.74; $t(39) = 2.34$, $p < .05$).

2.6.4.4 Buying intentions

A similar t-test showed that the presence of a close friend produced a lower buying intention (M = 4.86, SD = 1.17) compared to participants in the alone condition (M = 5.74, SD = 1.24; $t(39) = 2.32$, $p < .05$).

2.6.4.5 Mediation analysis

To assess whether experienced impulse strength mediated the impact of friendship on compulsive buyers' buying intentions, a mediation analysis was performed following recommendations by Baron and Kenny (1986). Replicating the results of the t-tests reported above, we first regressed experienced impulse strength on friendship, showing a significant effect of friendship (β = -0.35, $t(39) = 2.34$, $p < .05$). As a second step, we regressed buying intention on friendship, showing a significant effect of friendship (β = -0.35, $t(39) = 2.32$, $p < .05$). Third, a regression analysis with buying intention as criterion and friendship and experienced impulse strength as predictors, showed that impulse strength significantly predicts buying intention (β = 0.49, $t(38) = 3.45$, $p < .01$), whereas the effect of friendship was reduced to nonsignificance (β = -0.18, $t(38) = 1.25$, NS).

A bootstrapping procedure (5000 resamples; Preacher and Hayes 2008) confirmed that the effect of friendship on buying intention was mediated by experienced impulse strength (95% confidence interval, excluding zero: [-0.91, -0.13]).

2.6.4.6 Discussion

In sum, the current results confirmed that compulsive buyers are inclined to higher buying urges and buying intentions especially when they imagined being alone. The imagined presence of a close friend, however, reduced these tendencies and dampened their buying intentions. Moreover, we found that reduced impulse strength mediated these effects. Hence, the friendship effect generalized from consumers with temporary to consumers with chronic self-control deficits (i.e., from depleted consumers to compulsive buyers respectively).

2.7 EXPERIMENT 4

Experiment 3 identified experienced impulse strength as the driver underlying the impact of friendship on self-control. The current experiment was designed to collect converging evidence for this proposed underlying process, by supplementing the explicit self-report measure used in Experiment 3, with a more indirect, implicit measure of impulse strength. Moreover, we extended the findings of Experiment 3 by revisiting the role of temporary rather than chronic impairments in consumer self-control and by varying levels of self-regulatory resource depletion similar to Experiment 2.

We measured experienced impulse strength using an affective priming task (Häfner and Trampe 2009) and assessed consumer self-control similarly to Experiment 1, using a measure of impulsive spending. First, support for our approach and procedures would require confirming established effects of self-regulatory resource depletion on both impulse strength (Schmeichel et al. 2010) and impulsive spending (Vohs and Faber 2007). Next, and more important for the current theorizing, we expected to replicate the beneficial effects of being reminded of friendship on impulsive spending and on experienced impulse strength. Most notably, in line with our previous findings, we expect both effects to be moderated by self-regulatory resource depletion, such that the effects occur with consumers facing a temporary deficit in self-control resources. Furthermore, we expect the effect of reminders

of friendship on self-control to be mediated by reductions in experienced impulse strength.

2.7.1 Participants and Design

One hundred two undergraduate students participated in exchange for money or partial course credit. The study was part of a larger research project. From two participants we lacked data on several variables. In addition to these, two participants were excluded from further analysis because they faced language difficulties, and two for being outliers on several key dimensions (e.g., having values greater than four standard deviations above or below the mean on impulse strength), resulting in a final sample of 96 participants (54.2% male; mean age 20.68 years, SD = 2.13). The study used a 2 (friendship reminder procedure: reminder of friendship vs. neutral) × 2 (self-regulatory resource depletion: depletion vs. no depletion) between-participants factorial design.

2.7.2 Procedure

We used the same manipulations for the friendship reminder procedure and self-regulatory resource depletion as in Experiment 2. Upon arrival at the laboratory, participants were randomly assigned to one of four conditions and asked to sign an informed-consent form. The friendship reminder and self-regulatory resource depletion procedures were identical to Experiment 2. In short, participants were asked to write a short essay about an experience in which they felt strong friendship with a close friend (reminder of friendship condition) or about the manufacturing process of a wooden table (neutral condition). Self-regulatory resource depletion was manipulated by crossing off occasions of the letter *e*, either with or without additional complex rules that participants had to follow (depletion versus no-depletion condition respectively; Baumeister et al. 1998). After the experimental manipulations, participants received instructions for what they thought would be a measure of their perceptual speed and capacity, but in fact was an Affective Priming Task (APT; Fazio 2001; Fazio et al. 1986; Häfner and Trampe 2009) measuring the experienced strength of their impulses regarding consumption temptations (clothes and candy). Directly following this task, participants' willingness-to-pay for the consumption temptations

shown in the APT was measured. This measure of impulsive spending served as an indicator of consumer self-control.

2.7.3 Dependent Measures

2.7.3.1 Experienced impulse strength

As an indicator of experienced impulse strength, participants' automatic associations regarding consumption temptations (in terms of valence) were measured with an affective priming task adapted from Häfner and Trampe (2009). Positive automatic associations are known to activate approach tendencies (Friese et al. 2011; Strack and Deutsch 2004) and thus have been identified by previous research as valid indicators of experienced impulse strength (Friese et al. 2011; Schmeichel et al. 2010; Wiers et al. 2011).

2.7.3.2 Pre-test

A pre-test was conducted to create the stimulus-set of product images. Thirty participants (43.3% male, mean age 20.89 years, SD = 2.25) from the same population as the main study evaluated 30 product pictures: 26 pictures of utilitarian, basic furniture and household items (e.g., a chair, pencil or spoon) and 4 pictures of hedonic, tempting products (i.e., a cupcake, candy bar, shoes, and a shirt, the latter two tailored to the gender of the participant). They indicated the extent to which they considered each item tempting (1 = not at all tempting, 7 = very tempting) and the extent to which they have bought the product on impulse in the past (1 = totally disagree, 7 = totally agree). Results showed that the four consumption temptations were perceived as significantly more tempting (M = 4.13, SD = 1.26) and more often bought on impulse (M = 5.28, SD = 1.42) than the utilitarian products (M = 1.87, SD = 0.77, $t(29) = 10.52$, $p < .01$ and M = 1.47, SD = 0.59, $t(29) = 14.61$, $p < .01$ respectively).

2.7.3.3 Main experiment

After a fixation cross for 500 ms, participants saw a picture of a product for a very brief interval (200ms). Immediately after the presentation of the product, a positive or negative word was shown (randomly chosen from a list of 10; e.g., "happy" or "boring"), which participants had to categorize according to its valence as quickly as possible. The word remained on screen until participants pressed a key to categorize

either a positive (Z key) or a negative word (M key). Each categorization was followed by a 500 ms inter-trial interval, showing a fixation cross.

The four tempting products served as the target set, with the remaining 26 as neutral, filler products. All pictures appeared twice during the affective priming task, once followed by a positive and once followed by a negative word. The complete task therefore consisted of 60 trials.

Following Häfner and Trampe (2009), we subtracted the response latencies for trials in which a consumption temptation was followed by a positive word from those latencies in which a consumption temptation was followed by a negative word. Following previous research (Fazio et al. 1986; Friese et al. 2011; Schmeichel et al. 2010; Wiers et al. 2011) higher difference scores indicate more positive automatic associations regarding the consumption temptations and, hence, stronger experienced impulses. The difference scores across temptations were summed into one overall index of experienced impulse strength.

2.7.3.4 Impulsive spending

In line with previous research (Vohs and Faber 2007) participants listed the price they would be willing to pay for each of the four consumption temptations from the affective priming task. We used the sum across temptations as an overall index of impulsive spending.

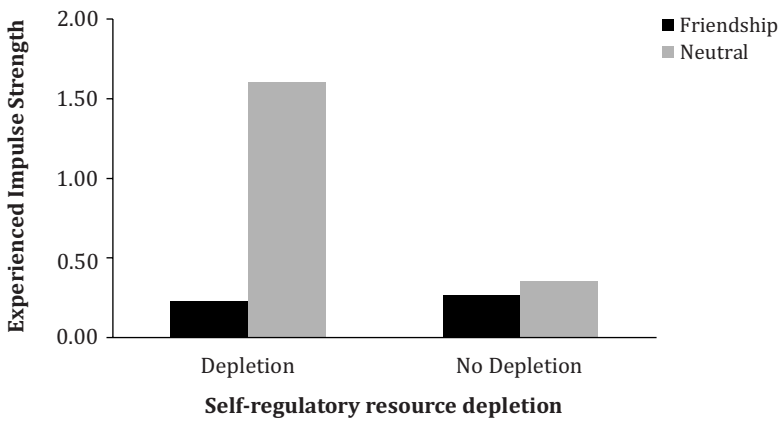
2.7.4 Results and Discussion

2.7.4.1 Experienced impulse strength

A full factorial ANOVA on impulse strength as a function of the friendship reminder procedure and self-regulatory resource depletion showed significant main effects of the friendship reminder condition and depletion condition. Participants reminded of friendship experienced weaker impulse strength (M = 0.23, SD = 0.98) than participants in the neutral condition (M = 0.91, SD = 1.69; ($F(1, 92) = 6.70$, $p < .05$). In addition and in line with findings of Schmeichel et al. (2010), participants who were depleted of their self-regulatory resources experienced stronger impulses (M = 0.80, SD = 1.80) than non-depleted participants (M = 0.30, SD = 0.69; $F(1, 92) = 4.65$, $p < .05$).

As predicted, the interaction between the friendship reminder procedure and self-regulatory resource depletion also was significant ($F(1, 92) = 5.14$, $p < .05$)‡. Simple main effects showed that the effect of the activation of friendship on impulse strength was only significant for depleted participants ($F(1, 92) = 12.23$, $p < .01$). That is, resource depleted participants exposed to the friendship reminder procedure showed significantly weaker impulses ($M = 0.22$, SD = 1.10) than depleted participants in the neutral condition ($M = 1.53$, SD = 2.24). Friendship condition did not affect experienced impulse strength among non-depleted participants ($M_{friendship} = 0.25$, SD = 0.83; $M_{neutral} = 0.34$, SD = 0.56, $F < 1$; Figure 2.2).

Figure 2.2: Experienced impulse strength as a function of friendship activation procedure and self-regulatory resource depletion



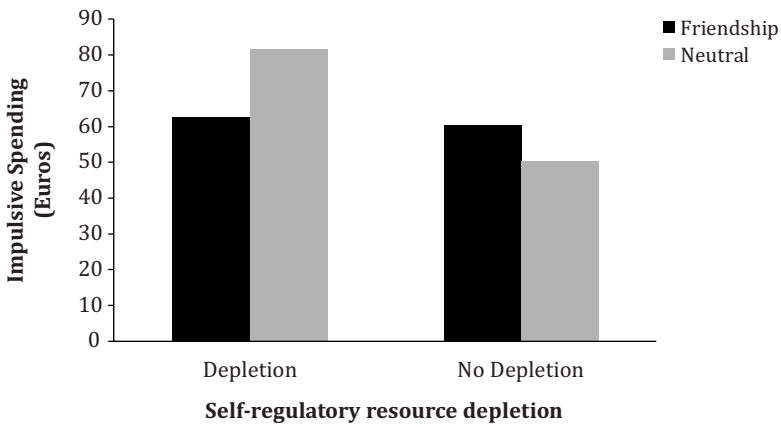
2.7.4.2 Impulsive spending

A full factorial ANOVA on our measure of impulsive spending showed a significant main effect of resource depletion ($F(1, 92) = 6.67$, $p < .05$). Replicating previous research (Vohs and Faber, 2007), depleted participants reported a higher willingness-to-pay for consumption temptations ($M = 71.04$ Euros, SD = 36.99) compared to participants in the no-depletion condition ($M = 55.10$ Euros, SD = 26.77). The main effect of the

‡ The interaction effect was significant for the tempting consumption products, but not for the utilitarian control products. This is in line with our theorizing, as friendship reduces experienced impulse strength for products that instigate an impulse.

friendship reminder procedure was not significant ($F < 1$). Importantly, the interaction between the friendship reminder procedure and self-regulatory resource depletion proved significant ($F(1, 92) = 4.88$, $p < .05$). In line with our results on experienced impulse strength, analysis of the simple main effects showed that the effect of the friendship reminder procedure was only significant in the depletion condition ($F(1, 92) = 4.36$, $p < .05$). As predicted, resource depleted participants exposed to the friendship reminder procedure reported a significantly lower willingness-to-pay for consumption temptations (M = 62.69 Euros, SD = 27.84) than depleted participants in the neutral condition (M = 81.67 Euros, SD = 44.55). For non-depleted participants, in contrast, the friendship reminder procedure had no effect on willingness-to-pay ($M_{friendship}$ = 60.24, SD = 25.54; $M_{neutral}$ = 50.31, SD = 27.51, $F(1, 92) = 1.11$, NS; Figure 2.3).

Figure 2.3: Impulsive spending as a function of friendship activation procedure and self-regulatory resource depletion



2.7.4.3 Mediation analysis

To assess whether experienced impulse strength mediated the impact of the activation of friendship and self-regulatory resource depletion on willingness-to-pay (i.e., impulsive spending), a mediated moderation analysis was performed using a series of regression analyses following recommendations by Baron and Kenny (1986)

and others (Preacher, Rucker, and Hayes 2007; Zhao, Lynch Jr., and Chen 2010). First, replicating the ANOVA results reported above, regressing willingness-to-pay on friendship condition and self-regulatory resource depletion condition showed a significant interaction between the friendship reminder procedure and depletion (β = -0.40, t = -2.21, p < .05). As a second step, we regressed experienced impulse strength on friendship and depletion conditions, which, in line with the previous ANOVA results, showed a significant interaction (β = -0.40, t = 2.27, p < .05). Third, a regression analysis with willingness-to-pay as criterion and friendship condition, self-regulatory resource depletion condition, and experienced impulse strength as predictors, showed that impulse strength significantly predicted willingness-to-pay (β = 0.27, t = 2.57, p < .05), whereas the interaction between the friendship and self-regulatory resource depletion conditions was reduced to nonsignificance (β = -0.29, t = 1.62, NS). A bootstrap analysis (5000 resamples; Preacher et al. 2007) confirmed that the influence of the friendship × depletion interaction on willingness-to-pay was indeed mediated by experienced impulse strength (95% confidence interval, excluding zero: [-25.25, -0.41]).

2.7.4.4 Discussion

The present experiment examined the influence of reminders of friendship on one of the key manifestations of impaired self-control in the consumer sphere: impulsive spending and focused on the key underlying process driving the friendship effect: impulse strength. Our results confirmed previous research showing that self-regulatory resource depletion reduces consumer self-control (Vohs and Faber 2007). Moreover, it contributes by showing that self-regulatory resource depletion increases impulse strength, as well as by demonstrating that friendship reminders assuage both effects of self-regulatory resource depletion. Importantly, depleted participants where the concept of friendship was activated displayed weaker impulses regarding consumption temptations than depleted participants who were not reminded of friendship. A significant mediation showed that this reduced impulse strength translated into reduced impulsive spending. Taken together, we conclude that in the face of (state) self-control deficits, activating the construct of friendship improves consumer self-control by reducing the experienced strength of consumption impulses.

2.8 GENERAL DISCUSSION

The average consumer is confronted with a multitude of consumption temptations on a daily basis. To resist succumbing to these temptations, consumers need self-control. Self-control, however, is not always sufficiently at consumers' disposal. Some consumers (e.g., compulsive buyers) may be more prone to giving in to consumption impulses than other consumers, and at times, situational factors cause self-control deficits in otherwise controlled consumers (i.e., when self-control resources are low due to a previous depleting activity). Whether caused at the trait or the state level, difficulties with resisting consumption temptations may ultimately have negative consequences (Faber and O'Guinn 2008; Friese 2000; Friese et al. 2011; Rook 1987; Zhang and Shrum 2009). The present research, however, demonstrates that all is not lost for consumers inclined towards impulsive consumption. Extending previous research showing the beneficial influence of friendship for health and well-being (Bishop and Interbitzen 1995; Krause and Wulff 2005; Lakey and Orehek, 2011; Schwartz, Dodge, Petit, and Bates 2000; Sullivan 1953), the present research contributes by showing the beneficial influence of reminders of friendship on consumer self-control.

Specifically, we show that consumers are better able to exert self-control in the face of consumption temptations when the notion of friendship is activated. We documented this finding among consumers in general and found that the effect is particularly pronounced with consumers chronically (trait) or temporarily (state) low in self-control (i.e., compulsive buyers and depleted consumers respectively). In addition to demonstrating the basic effect, we also identified the process underlying the effect of friendship on self-control. Using a shopping scenario (Experiment 3) and affective priming task (Experiment 4), we gathered converging evidence that reminders of friendship promote consumer self-control by reducing the strength of experienced impulses towards consumption temptations. By reducing impulse strength, friendship makes consumption impulses easier to overcome, and hence, impulsive consumption less likely.

We identified the beneficial effect of friendship on self-control across multiple measures and manipulations. First, we documented an effect of friendship on three manifestations of consumer self-control failure: impulsive spending, impulsive buying, and unplanned consumption. Second, across four experiments we used three manipulations to activate the concept of friendship: the actual, physical presence of an intimate friend, the imagined presence of an intimate friend, and

an established mindset activation procedure in the form of an essay writing task. Third, the experiments replicated known effects (depletion increasing impulsive buying indicators, for instance) and the current results were replicated directly and conceptually several times as well. These features garner confidence in the robustness of the effect.

We were able to rule out several alternative explanations. First, we eliminated the potential confounding role of mood and feelings of shame associated with social presence. Moreover, to address an alternative explanation in terms of mere social presence, we added a condition to our experimental design in which participants were accompanied by a stranger. Consistent with predictions, a close friend but not a stranger increased self-control among consumers, eliminating social facilitation by the mere presence of others as an alternative explanation.

The present research builds on studies showing that consumers with (trait or state) self-control deficits are prone to impulsive consumption (Baumeister 2002; Baumeister et al. 2007; Faber and O'Guinn 2008; Faber and Vohs 2011; Friese 2000; Friese et al. 2011; Ridgway et al. 2008; Rook 1987; Vohs and Faber 2007), and contributes in several ways. First of all, four experiments show that bringing friendship to mind counteracts the effect of self-control deficiencies on impulsive consumption. While existing research has primarily focused on factors *inhibiting* self-control (Ackerman et al. 2009; Baumeister et al. 2005; Finkel et al. 2006; Rook and Gardner 1993; Tice and Bratslavsky 2000; Vohs and Faber 2007), the current research contributes by identifying friendship as a situational factor *facilitating* self-control. As such, the current research has important implications for consumer well-being. Activation of the notion of friendship as a mechanism to enhance the self-control of compulsive buyers for instance, may contribute directly to interventions addressing this societal problem. Furthermore, research on self-control failure has mainly focused on failures of *impulse inhibition* (Baumeister et al. 1998; Baumeister et al. 2007; Finkel et al. 2006; Hagger et al. 2010; Heatherton and Vohs 1998; Muraven et al. 1998; Vohs et al. 2008; Vohs and Faber 2007; Vohs and Heatherton 2000), with much less attention for the influence of *impulse strength* (but see Schmeichel et al. 2010). The present research contributes to the growing literature on this neglected dimension of self-control.

This research also contributes to the literature on social relationships and self-control. In contrast to research on the influence of self-control on social relationships (Finkel and Campbell 2001; Finkel and Fitzsimons 2011; Fitzsimons

and Finkel 2011; Righetti and Finkenauer 2011; Van Dellen and Baker 2011; Vohs, Finkenauer, and Baumeister 2011), research addressing the reverse causal direction (i.e., the influence of social relationships on self-control), has been notably lacking (Finkel and Fitzsimons 2011; Stillman et al. 2009).

A final contribution of the current research concerns our conceptualization of consumers low in self-control. Recall that in Experiments 2-4, we identified consumers as compulsive buyers or manipulated self-regulatory resource depletion. In doing so, we connect the compulsive buying literature with literature on self-control failure by ego depletion. This is particularly relevant as researchers have not yet agreed on whether compulsive buyers should be seen as qualitatively different from regular consumers (Friese 2000; O'Guinn and Faber 1989) or whether they simply differ in terms of quantity (d'Astous, Maltais, and Roberge 1990; Dittmar, Long, and Bond 2007; Nataraajan and Goff 1992). Although the compulsive buyers used in this study were identified in the general population and we had no access to information about clinical diagnosis with respect to compulsive buying, the current research may hold valuable insights for this on-going debate. While we acknowledge the nature of our sample, the convergence of findings between compulsive buyers and depleted consumers may suggest a more quantitative rather than qualitative difference between both groups of consumers. With friendship they at least share a joint 'cure'.

Future research could explore boundary conditions for the friendship effect to occur. For example, research may assess the conditions under which the impact of the (real or imagined) presence of friends on self-control is further boosted or attenuated. For example, some studies showing a facilitative effect of the presence of other consumers on impulsive consumption examined the presence of a *group* rather than the influence of a single individual (Luo 2005; Zhang and Shrum 2008). Hence, the number of present friends may moderate the effect. Next to the number of friends present, future research might extend the current results on the mere psychological presence of friends by including their exemplar function. In the current work, the friend was either physically or psychologically present, but was never actually responding to the temptation him- or herself. Perhaps as 'enactment models' (Hofmann et al. 2011), the presence of a *splurging* friend may actually hinder, rather than promote consumer self-control. Conversely, the present findings may even be boosted when a friend actually shows restraint and self-control in the face of consumption temptations. This may explain the success of the Weight Watchers®, who have built their weight-control program around the notion that effective weight-loss begins with mobilizing friends.

However, as the more parsimonious and efficient alternative, the current results show that even through their mere presence, close friends promote consumer well-being, and so there is more than meets the eye to the classic sentence: “I get by with a little help from my friends.”

Chapter 3

Friendship & Inhibition Strength[§,¶]

Consumer self-control is as important as it is problematic in today's society filled with consumption temptations. Consumers seem to experience more and more difficulties with resisting the lure provided by tempting consumer goods: prevalence estimates of consumers who are classified as excessive or even compulsive buyers are as high as 8 to 16 per cent of the general population (Dittmar 2005; Faber and O'Guinn 1992). Despite these alarming numbers, all is not lost for consumers with self-control deficits: our own research has recently demonstrated that psychologically activating the concept of *friendship* enhances the self-control of consumers with (trait or state) self-control deficits (De Vries et al. 2013; see Chapter 2 of this dissertation). That is, our earlier studies suggest that when (trait or state) self-control is low, psychologically activating *friendship* leads to more controlled responses compared to a neutral control reminder.

Importantly, in the literature, the extent to which consumers are able to exercise self-control is thought to be a function of two competing forces: the strength of the impulse (i.e., desire) and the extent to which consumers have self-regulatory mechanisms available to inhibit their initial response to the impulse (i.e., inhibition strength; Baumeister 2002; Friese, Hofmann, and Wiers 2011; Hoch and Loewenstein

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1991). Our earlier studies focused on improvement of the impulse side of the self-control struggle (De Vries et al. 2013). The goal of the current research is to build on and extend our earlier findings by examining the role of friendship in the other factor involved in successful self-control: inhibition strength. As Friese et al. (2011) suggest, the most effective interventions against self-control failure are those interventions that improve *both* forces. Accordingly, the goal of the present research is to examine whether friendship also beneficially influences the self-regulatory mechanisms available to enable consumers to inhibit their consumption impulses, and if so, by what process. Recent research (Hedgcock, Vohs, and Rao 2012; Inzlicht and Gutsell 2007; MacDonald et al. 2000; Myrseth and Fishbach 2009) suggests that there may be two ways in which inhibition strength can be enhanced: by improving the capacity to identify conflict between desire and the goal to exert self-control, and/or by enhancing the capacity to actually implement control. In studying the impact of friendship on inhibition strength, we will examine the role of these two processes by combining behavioral and neuroimaging research methods. The use of functional magnetic resonance imaging (fMRI) is relatively new in consumer behavior (see for recent applications Hedgcock and Rao 2009; Hedgcock et al. 2012; Yoon et al., 2006) and allows researchers to examine physiological processes that reflect the hypothesized underlying mechanism for a particular effect, by allowing for the concurrent measurement of cerebral activation. By doing so, fMRI provides an advantage over behavioral studies, which provide a more retrospective account.

The first experiment reported in this chapter is a behavioral study. In this study, we provide preliminary evidence suggesting that when consumers low in trait self-control (i.e., compulsive buyers) are confronted with consumption temptations, the psychological activation of friendship enhances their capacity to identify conflict and improves their capacity to actually implement control. Hence, under conditions of low trait self-control, friendship seems to improve both processes constituting inhibition strength. Subsequently, in Experiment 2, we use fMRI to provide more direct evidence for the beneficial influence of friendship on both processes composing inhibition strength. If the psychological activation of friendship indeed improves both conflict identification and control implementation of compulsive buyers, we expected increased activation in the associated brain areas (i.e., in the anterior cingulate cortex (ACC) and dorsolateral prefrontal cortex (DLPFC) respectively).

3.1 IMPULSE STRENGTH, INHIBITION STRENGTH AND CONSUMER SELF-CONTROL

Expressions of self-control failure may be considered the result of two competing forces: impulse strength versus inhibition strength (Friese et al. 2011; Schmeichel, Harmon-Jones, and Harmon-Jones 2010). Whereas impulse strength refers to the strength of consumption impulses (e.g., the extent to which a consumer feels the allurement of a pair of great-looking shoes in a shop window), inhibition strength consists of the self-regulatory mechanisms involved in suppressing or overriding the consumption impulse (e.g., the extent to which the consumer can resist the impulse to buy the shoes; Friese et al. 2011; Schmeichel et al. 2010). As long as both forces remain in balance, a homeostatic state of self-control exists (Friese et al. 2011; Schmeichel et al. 2010). However, a state of self-control failure ensues when either impulse strength increases (without a simultaneous increase in inhibition strength) and/or inhibition strength decreases (Schmeichel et al. 2010). It is under these conditions that consumers may engage in forms of uncontrolled consumption (Vohs and Faber 2007). For instance, compulsive buying, the uncontrolled, excessive buying of consumer goods (Dittmar 2005), has been characterized by irresistible urges (high impulse strength) and loss of control over these urges (low inhibition strength; Dittmar et al. 2007). Conversely, consumer self-control may be enhanced (i.e., homeostasis can be restored) by either decreasing impulse strength or increasing inhibition strength (Friese et al. 2011; Schmeichel et al. 2010).

Our earlier research has shown that psychologically activating friendship enhanced the self-control of consumers with (state or trait) self-control deficits by reducing the strength of consumption impulses. That is, we found that the psychological activation of friendship when self-regulatory resources were low made consumers perceive consumption temptations as less attractive than when the concept of friendship had not been psychologically activated. For instance, one of the studies focused on compulsive buyers, consumers who are typically characterized as being chronically low in self-control (Faber and Vohs 2011). When consumers classified as compulsive buyers had been primed with friendship, they reported less intense buying impulses compared to a control prime. This reduction in impulse strength led to lower buying intentions (De Vries et al. 2013). The current research aims to extend these findings by addressing the question of whether the psychological

activation of friendship also enhances self-control by positively influencing the other factor involved in the self-control struggle: inhibition strength.

3.2 FRIENDSHIP ENHANCES INHIBITION STRENGTH

The literature offers some suggestions in support of our hypothesis that friendship, defined as a *close*, intimate, mutual relationship with a same-sex peer (Sullivan 1953) may enhance the strength to inhibit consumption impulses. Baumeister and colleagues (Baumeister and Stillman 2008; Stillman et al. 2009) argue that there is a reciprocal relationship between social relationships and self-control. According to what they call an *implicit bargain* (Baumeister et al. 2005; Baumeister and Stillman 2008; Stillman et al. 2009), social relationships are such an important aspect of life that securing those relationships withholds people from yielding to (consumption) temptations that might put them at risk of social exclusion (Baumeister et al. 2005). Hence, self-control operates mainly in the service of (inclusion in) important social networks. However, if the effort and energy spent on self-control does not result in satisfactory relationships, the 'implicit bargain' breaks down, and people lose their motivation to self-regulate (Baumeister et al. 2005; Stillman et al. 2009). For instance, participants excluded from social relationships showed a higher likelihood of choosing a tempting rather than a healthy food option compared to those not experiencing a lack of social relationships (Twenge, Catanese, and Baumeister 2002). Accordingly, one might argue that if impaired social relationships diminish the motivation to self-regulate, the opposite should also hold: successful close relationships would represent a fulfillment of the bargain and would further promote self-control through the inhibition of impulses (Baumeister and Stillman 2008). Indeed, Stillman et al. (2009) report that participants who had been primed with family displayed a number of behaviors that can be construed as involving self-control (e.g., solving math problems). Hence, we hypothesize that under conditions of (trait) self-control deficits, psychologically activating friendship increases consumers' capacity to inhibit consumption impulses (i.e., enhances inhibition strength).

3.3 ENHANCED INHIBITION STRENGTH THROUGH IMPROVED CONFLICT IDENTIFICATION VERSUS CONTROL IMPLEMENTATION

Drawing upon the two stage model of cognitive control (Inzlicht and Gutsell 2007; MacDonald et al. 2000; Myrseth and Fishbach 2009), there may be two ways by which the self-regulatory mechanisms available to inhibit consumption impulses may be enhanced: by improving *conflict identification* (i.e., the capacity to recognize conflict between acting upon immediate desires and long-term self-control goals) and/or *control implementation* (i.e., the capacity to actually implement a controlled response while suppressing the incompatible impulse; Hedgcock et al. 2012; Inzlicht and Gutsell 2007). Hence, if friendship enhances the inhibition strength of consumers low in trait self-control (e.g., compulsive buyers), it may do so by either improving their capacity to recognize conflict, like the conflict between the immediate reward of buying an attractive but expensive pair of shoes versus keeping a healthy budget (i.e., conflict identification), by improving their capacity to actually refrain from buying (i.e., control implementation) or a combination of both (Hedgcock et al. 2012).

In the behavioral domain, improved conflict identification may manifest itself as higher response latencies on tasks requiring impulse inhibition (e.g., the consistently higher response latencies on incongruent versus congruent trials of Stroop Tasks – the incongruent trials comprising conflict; MacLeod 1992), whereas enhanced control implementation shows from improved performance (i.e., the actual inhibition of impulses) on such tasks.

Moreover, researchers have begun to provide insight beyond these behavioral outcomes by exploring the neural correlates of inhibition strength. Specifically, neuroimaging findings show that consumers' capacity to identify conflict and to implement control can reliably be distinguished from each other as they rely on two separate neural systems (MacDonald et al. 2000). Whereas consumers' conflict identification is closely associated with activation the ACC, their ability to implement control is closely associated with the DLPFC (MacDonald et al. 2000).

The ACC is a brain area known as the conflict detection center in the brain (Botvinick et al. 1999; Hedgcock and Rao 2009; Schmeichel et al. 2010). It identifies self-control conflict, and subsequently triggers the need for increased cognitive control to overcome temptations (Botvinick, Cohen, and Carter 2004; Carter et al. 1998; Pochon et al. 2008; Wagner and Heatherton 2011). As a consequence, failures

of conflict identification have been associated with reduced activation in the ACC (Inzlicht and Gutsell 2007).

The dorsolateral prefrontal cortex (DLPFC) is recognized as the brain area engaged with the actual implementation of self-control and specifically with the capacity to actually inhibit (consumption) impulses (Knoch and Fehr 2007; Liddle, Kiehl, and Smith 2001). As such, failures of control implementation have been associated with reduced activation in the DLPFC (Hedgcock et al. 2012), whereas enhanced inhibition of (consumption) impulses has consistently been associated with increased DLPFC activation (Hare, Camerer, and Rangel 2009; Liddle et al. 2001; MacDonald et al. 2000; Menon et al. 2001).

In sum, depending on whether friendship enhances inhibition strength by improving conflict identification and/or by control implementation, the psychological activation of friendship may increase activation in the ACC and/or DLPFC respectively (Hedgcock et al. 2012; Inzlicht and Gutsell 2007).

3.4 PRESENT RESEARCH

In the present research we explore the role of the psychological activation of friendship in increasing inhibition strength when trait self-control is low. In doing so, we focus on two processes constituting inhibition strength: consumers' capacity to identify conflict and their capacity to actually implement control. In our studies, we focus on consumers classified as compulsive buyers. Compulsive buyers' consistent lack of control over their buying impulses suggests that these consumers are chronically low in inhibition strength in the consumption domain (Faber and O'Guinn 2008; Faber and Vohs 2011; Ridgway, Kukar-Kinney, and Monroe 2008). The first experiment is a behavioral study and examines whether psychologically activating friendship (versus a neutral activation condition) improves compulsive buyers' conflict identification and/or control implementation, as exemplified by behavioral measures. In addition, Experiments 1 tests the validity of our assumption that compulsive buyers are lower in inhibition strength than consumers not classified as compulsive buyers. In Experiment 2, we use fMRI to obtain real-time observations on the process by which friendship may enhance inhibition strength (Huettel et al. 2009): dependent on whether the psychological activation of friendship improves conflict identification

and/or control implementation, we expected enhanced activation in the ACC and/or DLPFC when friendship is psychologically activated.

3.5 EXPERIMENT 1

To study the impact of the psychological activation of friendship on inhibition strength, we used a pre-validated measure of participants' capacity to inhibit impulses: the Go/No-go task (Batterink, Yokum and Stice 2010; Liddle et al. 2001; Mishra and Mishra 2010; Newman, Widom and Nathan 1985; Yechiam et al. 2006). In a Go/No-go task participants are instructed to actively respond to certain stimuli, whereas they have to inhibit their (prepotent) response to other stimuli. If our assumption that compulsive buyers are chronically low in inhibition strength is true, compulsive buyers should perform worse on the Go/No-go task (i.e., have lower average response latencies and make more failures when asked to inhibit their response) than non-compulsive buyers. Moreover, if our hypothesis that psychologically activating friendship aids in self-control through increasing inhibition strength is correct, then compulsive buyers should show improvement in either one or both of the processes constituting inhibition strength. That is, compulsive buyers should demonstrate increased conflict identification and/or control implementation (as measured by higher average response latencies and fewer failures of inhibition on the Go/No-go task) after the psychological activation of friendship compared to when friendship has not been psychologically activated. In line with our earlier research (De Vries et al. 2013), we did not expect to find an effect of friendship with non-compulsive buyers, as these participants likely possess sufficient inhibition strength for effective self-control (Vohs and Heatherton 2000), obviating the role of friendship.

3.5.1 Participants and Design

Sixty nine female, right-handed undergraduate students participated as part of a larger study, in exchange for money or partial course credit. To recruit participants, leaflets announcing a study on shopping were distributed on campus. As circa 90 percent of compulsive buyers are female (Dittmar et al. 2007; Dittmar, Long, and Meek 2004), only women were invited to participate. Moreover, anticipating on the fMRI study of Experiment 2 in which all participants should be right handed, we chose

to minimize potentially confounding factors by using only right-handed participants in this experiment also. Five participants were excluded from further analysis. Three of them had recently participated in a similar Go/No-go task, one participant did not comply with experimental instructions and one participant reported an extremely negative mood (i.e., having values greater than two standard deviations below the mean; Hair et al. 2009. This resulted in an effective sample of 64 participants (mean age 19.81 years, SD = 1.73). The study employed a one-factor (friendship activation procedure: activation of friendship versus neutral) between-subjects design, with compulsive buying tendency as a continuous moderator.

3.5.2 Procedure

Upon arrival at the laboratory, participants were randomly assigned to one of two conditions. After signing an informed-consent form, they were individually seated in cubicles. Computer instructions told them that the experiment consisted of several unrelated tasks. The first task involved the friendship manipulation, using an established mindset activation procedure (Stillman et al. 2009; Zhang and Shrum 2009). In line with the definition of friendship by Sullivan (1953), participants in the psychological activation of friendship condition were asked to describe a situation in which they had felt strong friendship with a close, same-sex friend. In the relationship-neutral (control) condition, participants were asked to describe the manufacturing process of a wooden table. All participants were asked to write at least four sentences and to be as accurate as possible in their description. In the friendship condition, participants were required to use the following words in their essay: *we, together, friendship* and *bond*. In the neutral condition, these words were: *trees, wood, sawmill* and *truck*.

Immediately following the friendship activation procedure, all participants participated in a Go/No-go task. This task was presented as a response latency test, but in reality was designed to measure participants' capacity to identify conflict and to implement control by inhibiting their behavioral impulses towards buying temptations. After completing the Go/No-go task, participants indicated their mood (1 = very negative; 7 = very positive) to account for potential mood effects. Next, participants completed the compulsive buying scale developed by Faber and O'Guinn (1992). This scale consists of 7 items, like: "I bought things even though I couldn't afford them," and "I felt others would be horrified if they knew of my spending habits,"

ranging from (1) *strongly disagree/never* to (5) *strongly agree/very often*. We used the average score on this scale as an indicator of compulsive buying tendency ($\alpha = .72$), with higher scores indicating a higher tendency. Finally, as a manipulation check, participants in the friendship condition were asked: "How close is the bond between you and the friend you wrote about?" and "How close are you to this friend?" Both items ranged from (1) *not close at all* to (7) *very close* and were averaged ($r = .80$) into an indicator of friendship closeness.

3.5.3 Dependent Measures

The main variables of interest were two processes constituting inhibition strength: participants' capacity to identify conflict and to implement control, respectively measured by the average response latency and number of inhibition failures and on a Go/No-go task.

The Go/No-go task is an established measure of inhibition strength (Batterink et al. 2010; Mishra and Mishra 2010; Newman et al. 1985; Yechiam et al. 2006) and requires participants to perform speeded responses on Go trials, while inhibiting their response to No-go trials. We used a buying temptations-specific Go/No-go task, consisting of 96 trials. For each trial, a picture was presented for 500 ms. Of all the trials, 75% consisted of Go-trials and consisted of a picture of very basic furniture (e.g., simple chairs, tables and sofas). The remaining 25% of the trials were No-go trials and consisted of pictures of buying temptations in the form of clothes and accessories (e.g., dresses, jewelry and high heeled shoes). We chose clothes and clothing accessories to exemplify the buying temptations as these products are typically bought excessively by female compulsive buyers (Dittmar and Drury 2000). Following existing literature (Batterink et al. 2010; Simmonds, Pekar, Mostofsky 2008), we used around three times more Go than No-go trials, to make responding the prepotent response and therefore inhibition more difficult. Participants were instructed to respond as quickly as possible (by pushing the / key). Each trial was followed by a 500 ms inter-trial interval, showing a fixation cross. This fixation cross appeared directly after the participant's response. In case of non-response, the fixation cross automatically appeared 750 ms. after stimulus presentation. Reaction times were measured from the beginning of trial onset. Trials were presented in pseudo-randomized order, designed so clothes appeared after one, two or three pictures of furniture.

3.5.3.1 Conflict identification

The average of all response latencies on clothing trials (750 ms. in case a participant correctly withheld response; Mishra and Mishra 2010) served as our measure of conflict identification. As the absence of conflict detection is arguably quicker than detection of the conflict that exists between participants' dominant response to respond to clothing items and performing well on the Go/No-go task (i.e., *not* responding to clothing items), we consider participants' average response latency an indicator of conflict identification. We consider higher average response latencies as an indication of participants' capacity to identify conflict.

3.5.3.2 Control implementation

The total number of failures to inhibit response to clothing items reflects participants' capacity to actually implement self-control. Hence, the total number of inhibition failures a participant made served as our measure of control implementation, with lower numbers indicating better control implementation. Sum scores ranged from 1 to 14.

3.5.4 Results and Discussion

3.5.4.1 Manipulation check

An one-sample t-test using the scale's mid-point (i.e., 3.5) as a benchmark confirmed that participants in the friendship condition wrote about a friendship they considered to be close (M = 5.84; SD = 0.86; $t(37) = 16.73$, $p < .001$).

3.5.4.2 Mood

The psychological activation of friendship did not affect participants' mood ($t(62) = -0.91$, $p = .37$).

3.5.4.3 Conflict identification

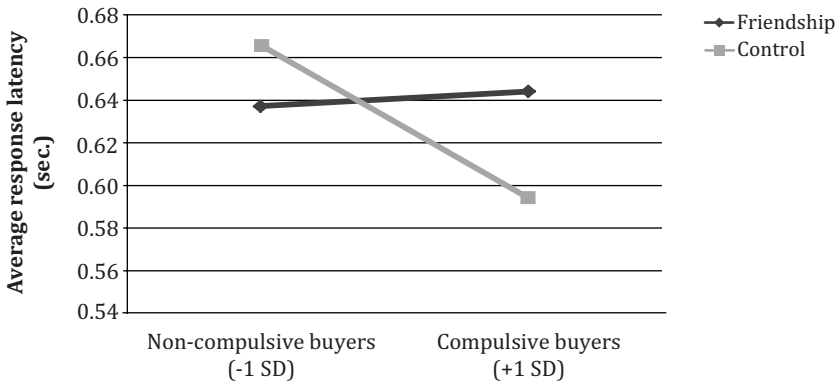
After standardizing the compulsive buying tendency measure (M = 0; SD = 1), we performed a regression analysis on average response latency with the friendship activation procedure, compulsive buying tendency, and their interaction as predictors. This analysis showed a conditional effect for compulsive buying tendency (B = -0.04, $t(62) = -2.62$, $p < .05$), indicating that, in the absence of the psychological activation of friendship, the higher participants' compulsive buying tendency was, the lower

their average response latencies. There was no conditional effect of the friendship activation procedure (B = 0.01, $t(62)$ = 0.76, p = .45), indicating that the psychological activation of friendship has no significant effect on the average response latency of participants with average levels of compulsive buying tendency. Importantly, the expected interaction between the friendship activation procedure and compulsive buying tendency was significant (B = 0.04, $t(62)$ = 2.57, p < .05; see Table 3.1). Following recommendations by Aiken and West (1991) and others (Fitzsimons 2008; Hayes 2012), we estimated regression lines at one standard deviation above (labeled compulsive buyers) and one standard deviation below the mean (labeled non-compulsive buyers). Subsequent analyses indicated that, as predicted, compulsive buyers in whom friendship had been psychologically activated displayed higher average response latencies than compulsive buyers in whom friendship had not been psychologically activated (B = 0.05, $t(62)$ = 2.34, p < .05). However, for non-compulsive buyers friendship did not affect their average response latency (B = -0.03, $t(62)$ = -1.60, p = .11; see Figure 3.1).

Table 3.1: Conflict identification and control implementation as a function of friendship activation procedure and compulsive buying tendency: Results from regression

Effects per Dependent Variable	*B*	Standard error	*t*	*p*
Conflict Identification: Average response latency				
Constant	0.63	0.01	66.74	.001
Friendship activation procedure	0.01	0.01	0.76	.453
Compulsive buying tendency	-0.04	0.01	-2.62	.011
Friendship activation procedure × Compulsive buying tendency	0.04	0.02	2.57	.013
Control Implementation: Failures of inhibition				
Constant	5.14	0.52	9.84	.001
Friendship activation procedure	-0.28	0.67	-0.41	.684
Compulsive buying tendency	1.97	0.74	2.64	.011
Friendship activation procedure × Compulsive buying tendency	-2.22	0.83	-2.68	.010

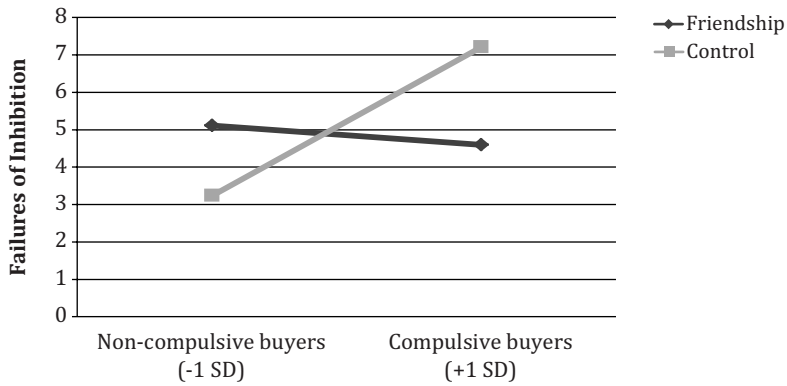
Figure 3.1: Average response latency as a function of friendship activation procedure and compulsive buying tendency



3.5.4.4 Control implementation

A regression analysis on failures of inhibition with the friendship activation procedure, compulsive buying tendency, and their interaction as predictors, showed results in line with the regression analysis on average response latency. There was a conditional effect for compulsive buying tendency (B = 1.97, $t(62)$ = 2.64, $p < .05$), indicating that, in the absence of the psychological activation of friendship, the higher participants' compulsive buying tendency was, the more inhibition failures they made. There was no conditional effect of the friendship activation procedure (B = -0.28, $t(62)$ = -0.41, p = .68), indicating that the psychological activation of friendship has no significant effect on failures of inhibition with participants with average levels of compulsive buying tendency. More importantly, the expected interaction between the friendship activation procedure and compulsive buying tendency was significant (B = -2.22, $t(62)$ = -2.68, $p < .01$; see Table 3.1). Subsequent simple slope analyses (Aiken and West 1991; Fitzsimons 2008; Hayes 2012) indicated that, as predicted, compulsive buyers in whom friendship had been psychologically activated made less inhibition failures than compulsive buyers in the control condition, where friendship had not been psychologically activated (B = -2.61, $t(62)$ = -2.23, $p < .05$). For non-compulsive buyers the psychological activation of friendship marginally affected the number of inhibition failures made (B = 1.87, $t(62)$ = 1.93, p = .06; see Figure 3.2).

Figure 3.2: Failures of inhibition as a function of friendship activation procedure and compulsive buying tendency



Experiment 1 showed that compulsive buyers perform worse on measures of both conflict identification and control implementation (as indicated by lower average response latencies and more failures of inhibition) than non-compulsive buyers. This supports our conceptualization of compulsive buyers as consumers chronically low in inhibition strength. Importantly, and consistent with our hypothesis, psychologically activating friendship enhanced compulsive buyers' inhibition strength. In fact, psychologically activating friendship improved compulsive buyers' capacity to identify conflict and implement control to levels comparable to that of non-compulsive buyers.

3.6 EXPERIMENT 2

In the first experiment, we provided preliminary evidence suggesting that the psychological activation of friendship significantly enhances compulsive buyers' inhibition strength by improving both their capacity to identify conflict and to implement control. The goal of Experiment 2 is to provide more direct evidence for these findings by examining the neural correlates of the friendship effect by means of fMRI. Advantage of fMRI above the use of behavioral methods is that fMRI allows us to observe activation in brain areas that have been reliably associated with conflict identification and control implementation (Hedgcock et al. 2012; MacDonald et al. 2000). Hence, if the psychological activation of friendship indeed improves the conflict

identification and control implementation of consumers low in trait self-control, we expected increased activation in the ACC and DLPFC compared to situations in which friendship has not been psychologically activated. Moreover, we expected this effect to be moderated by product type and to be correlated with compulsive buying tendency. That is, friendship would only enhance inhibition strength with products that constitute buying temptations (i.e., products which evoke buying impulses that should be inhibited in the first place; like clothes and clothing accessories for female consumers rather than non-hedonic products like pieces of basic furniture; Dittmar and Drury 2000). Finally, in line with Experiment 1, we expected this effect to be stronger for compulsive than non-compulsive buyers. Non-compulsive buyers likely possess sufficient inhibition strength for effective self-control, obviating the role of friendship.

3.6.1 Participants and Design

After approval of the Medical Ethical Committee of the University of Groningen, forty female undergraduate students (mean age 20.35 years, SD = 1.82, matching the onset age of compulsive buying; Black, 2007) participated in exchange for money (20 Euros; Hedgcock and Rao 2009). In a pretest, twenty of them had been identified as compulsive buyers and twenty of them as non-compulsive buyers (i.e., having a sumscore of ≥ 25 or < 20 on the Compulsive Buying Scale respectively; Ridgway et al. 2008). To ensure generalizability, we used a different scale to measure compulsive buying tendency than in Experiment 1. All participants had indicated a preference for buying clothing when shopping. They were all right-handed, native in the language the study was conducted and had normal or corrected-to-normal vision. We screened all participants to ensure no neurological and psychiatric history and safety in a magnetic resonance imaging (MRI) scanner. We also made sure that all participants used the contraceptive pill, to control for differences in neural response throughout the menstrual cycle (Dreher et al. 2007). The study employed a mixed-model repeated measures design, with friendship (friendship activation procedure: before versus after) and product type (clothing versus furniture) as within-subjects factors and compulsive buying tendency as a between-subjects factor. Friendship and product type were manipulated whereas compulsive buying tendency was measured.

3.6.2 Procedure

Before the fMRI session, participants were thoroughly informed about fMRI research in general, potential risks, the overall purpose (i.e., described as examining the neurobiology of purchase behavior) and the procedure of our study. All participants signed an informed-consent form, stating that they were well informed, had carefully thought about their participation and were aware that they could end their participation at any point in time without negative consequences.

Participants were individually put into the MRI scanner with their head securely placed in a head coil to prevent excessive movement. Stimuli were projected on a screen outside the scanner that participants viewed via a mirror located above their eyes. Participants could respond with their right hand, pushing a button on a response box.

During the fMRI session, that lasted for approximately one hour (Yoon et al. 2006), participants first participated in two Go/No-go tasks. They subsequently proceeded with a friendship activation procedure similar to Experiment 1. Next, participants participated again in two Go/No-go tasks.

After participation in the four Go/No-go tasks, the fMRI session was completed and participants were asked to indicate their agreement with the following statement to check the effectiveness of the manipulation: "During my description of the situation in which I felt strong friendship, I re-experienced the bond with this friend," ranging from (1) *totally disagree* to (7) *totally agree*. We lacked data of one participant on this variable.

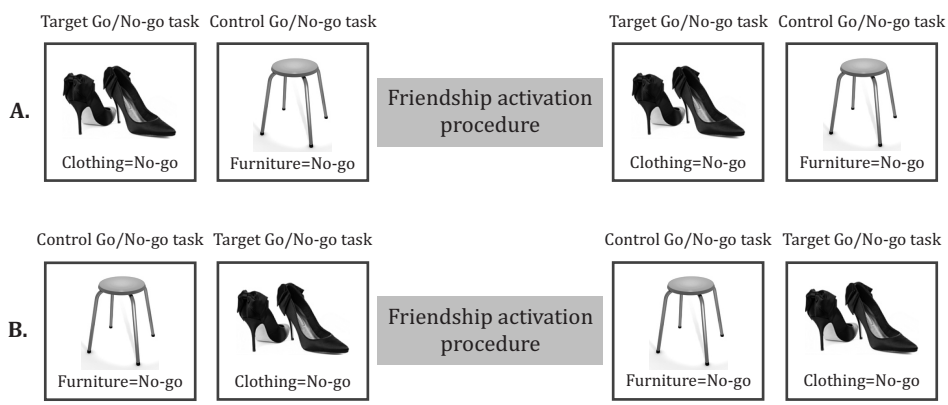
3.6.3 Friendship Activation Procedure

During the friendship activation procedure participants were asked to orally describe a situation in which they had felt strong friendship with a close, same-sex friend (Sullivan 1953). They were instructed to use the following words in their description: *we, together, friendship* and *bond*, to be as accurate as possible and to keep telling about the friendship experience for five minutes. To encourage participants to describe a real and personal story about friendship, it was stressed that they could only be heard by the experimenters and that their description would not be recorded. If participants finished their description before the 5 minutes were over, participants were asked to keep thinking about the friendship experience.

3.6.4 Dependent Variable

Participants performed a series of Go/No-go tasks that was similar to the Go/No-go task of Experiment 1 in terms of instructions and nature of stimuli, but was adapted to the needs of fMRI data acquisition and analysis in terms of the timing and number of stimuli. All participants participated in a target and a control Go/No-go task. In each Go/No-go task, 80 pictures were presented to participants in randomized order. Like in Experiment 1, in the target version of the Go/No-go task, the Go trials (70% of the trials) consisted of pictures of 'non-tempting' products (very basic furniture), whereas the No-go trials (30% of the trials) consisted of pictures of buying temptations (attractive women's clothing and clothing accessories). To control for potential confounds, the Go and No-go stimuli were mirrored in the control Go/No-go task (i.e., the Go trials consisting of clothes and clothing accessories and the No-go trials consisting of very basic furniture). By random assignment, half of the participants started the fMRI session with the target version of the Go/No-go task and subsequently performed the control version, whereas the other half started with the control version and continued with the target version (path A or B respectively; see Figure 3.3). After the friendship activation procedure, all participants, now primed with the concept of friendship, participated again in the two Go/No-go tasks. For each participant, the order of the two final Go/No-go tasks was identical to the first two tasks.

Figure 3.3: Sequence of the four Go/No-go tasks and friendship activation procedure dependent on path A or B



In both versions of the Go/No-go task, pictures were presented on a light grey background, using Eprime 2.0. Each Go/No-go task was made up of *10 trial-blocks*, consisting of 8 (randomly presented Go or No-go) trials and 8 inter-trial intervals, and *11 fixation-blocks* showing a 20 sec. fixation cross. The fixation-blocks served to start and finish the Go/No-go task and to separate the 10 trial-blocks from each other. Trials in the trial-blocks were presented for 500 ms. and separated by a 2080 ms. inter-trial interval, showing a fixation cross. The brain activation in the ACC and DLPFC during No-go (inhibition) trials served as our dependent variable (Batterink et al. 2010).

3.6.5 fMRI Data Acquisition

Functional data were collected using a Philips 3T Intera MRI scanner with an 8-channel head coil located at the NeuroImaging Center of the University of Groningen, The Netherlands. For each participant a T1-weighted *anatomical image* was recorded to provide a high-resolution image of the anatomy of the brain over which the later acquired functional data could be overlaid (Yoon et al. 2006). The T1-weighted anatomical image (170 axial slices) was recorded with a voxel size of 1 x 0.6 x 1 mm (voxels can be seen as the three-dimensional analog of pixels), using an Repetition Time of 9 ms and an Echo Time (TE) of 3.58 ms. Following the anatomical image, the *functional* data were recorded based on Echo Planar Imaging. These functional recordings (39 axial slices in an ascending order) were made using the following settings: a time of 2.0 sec. between two scans (Repetition time; RT); a TE of 30 ms; Flip Angle of 70 degrees; Field of View of 224 x 136.5 x 224 mm; Inplane resolution of 3.5 mm and slice thickness of 3.5 mm. For each participant four runs of functional data were recorded (one for each Go/No-go task) comprising 215 volumes and lasting for approximately 7 minutes each.

3.6.6 fMRI Data Analysis

Preprocessing of the data was performed to correct for several types of task unrelated variability (Huettel, Song, and McCarthy 2004; Yoon et al. 2006), using FSL version 5.0 (Jenkinson et al. 2012). Preprocessing included motion correction (e.g., head movements, using MCFLIRT; Jenkinson et al. 2002), non-brain removal (using the Brain Extraction Tool), spatial smoothing (using a kernel size of 10 mm FWHM), and

high-pass filtering (set at 100 s). Spatial normalization (i.e., correcting for variability in brain size and shape by mapping the data on a 'standard' brain; Yoon et al. 2006) took place by registering the T1 anatomy image of the participant to the MNI 152 stereotactic template using an affine procedure with a 12 parameter fit. Data of two participants were preprocessed using a nonlinear registration (FNIRT).

After preprocessing, general linear models were constructed both at the subject-level and group-level (FEAT). At (fixed effects) subject-level, event-related models were built. In these models, each stimulus event (i.e. a trial) was specified as a first condition with a duration of 2.5 sec for each event. No-go trials were modeled as an additional effect in the second condition. A single gamma function was convolved with all conditions to compensate for the hemodynamic delay. Furthermore, we added the output from the motion correction (MCFLIRT) as motion parameters to control for potential confounds. The effect of the No-go trials versus baseline contrast was defined at subject-level and taken as input into group-level analyses. This effect was calculated for each of the four runs separately and resulted in No-go (inhibition) effects before and after the friendship prime as well as for the two product types. Subsequently, we built a fixed effect model per subject for these four inhibition effects and calculated the interaction effect between friendship and product type. The formula of the interaction term was: (activation during clothing pictures after the friendship activation procedure – activation during clothing pictures before the friendship activation procedure) – (activation during furniture pictures after the friendship activation procedure – activation during furniture pictures before the friendship activation procedure). Finally, in a mixed effects model (FLAME 1), we tested across subjects whether this interaction effect correlated with compulsive buying tendency, which was added as a covariate.

All analyses were carried out using FEAT version 5.98. For group analyses we used FLAME (FMRIB's Local Analysis of Mixed Effects stage 1; Beckmann et al. 2003; Woolrich et al. 2004).

Consistent with previous research (Dietvorst et al. 2009; Hedgcock et al. 2012; Yoon et al. 2006), we adopted a region-of-interest (ROI) approach, using a mask to restrict analysis to specific anatomical regions rather than testing the entire brain.

Results were considered significant on the basis of $Z > 2.0$ at voxel level combined with a cluster significant threshold of $p < .05$ (Worsley 2001). These thresholds were corrected for the size of the region of interest.

Masks were created using FSL software and included Brodmann's areas BA 24 and BA 32 for the ACC (Hare et al. 2009; Hedgcock et al. 2012; MacDonald et al. 2000) and BA 9 for the DLPFC. BAs 24 and 32 have been associated with conflict identification (Hedgcock et al. 2012; Inzlicht and Gutsell 2007; Kerns et al. 2004; MacDonald et al. 2000), whereas BA 9 has previously been associated with control implementation.

3.6.7 fMRI Results and Discussion

3.6.7.1 Manipulation check

An one-sample t-test using the scale's mid-point (i.e., 3.5) as a benchmark confirmed that participants had re-experienced the bond with their friend during their description of the friendship experience (M = 5.56; SD = 1.02; $t(38) = 12.63$, $p < .001$). The activation of friendship manipulation can thus be considered successful.

3.6.7.2 Conflict identification

A mixed effects GLM on brain activation in the ACC (BA24/32) during inhibition (No-go) trials as a function of friendship, product type and compulsive buying tendency showed no main effects of friendship or product type. Importantly however, the interaction between friendship and object type with the parametric modulation of compulsive buying tendency was significant (BA24/32; see Table 3.2 and Figure 3.4). That is, we found significantly greater activation in the ACC when participants were asked to inhibit their response towards pictures of clothes (versus non-hedonic pictures of furniture) after the psychological activation of friendship compared to when friendship was not psychologically activated. Moreover, the interaction was positively correlated with compulsive buying tendency (r = .48), meaning that the effect of friendship was stronger the higher participants' compulsive buying tendency. These results are in line with our results from Experiment 1, where we identified the beneficial effect of friendship on conflict identification, as previous research has identified the ACC as the conflict detection center in the brain (Botvinick et al. 1999; Hedgcock and Rao 2009; Schmeichel et al. 2010).

3.6.7.3 Control implementation

A mixed effects GLM on brain activation in the DLPFC (BA9) during inhibition (No-go) trials as a function of friendship, product type and compulsive buying tendency showed no main effects of friendship or product type. The interaction between

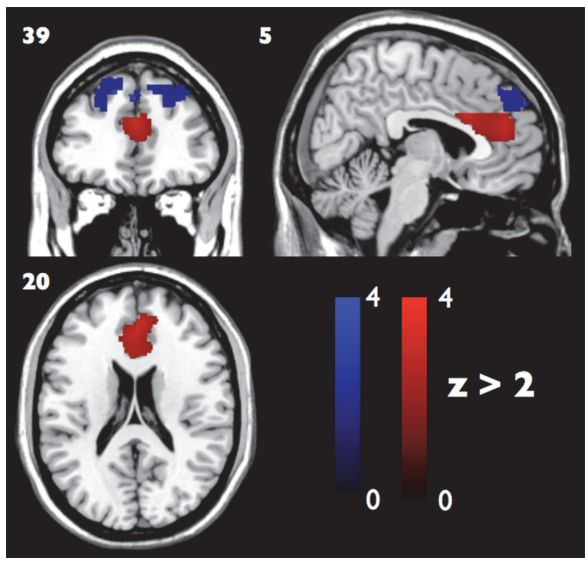
friendship and object type with the parametric modulation of compulsive buying tendency however, proved significant (see Table 3.2 and Figure 3.4). That is, we found significantly greater activation in the DLPFC when participants were asked to inhibit their response towards pictures of clothes (versus non-hedonic pictures of furniture) after the psychological activation of friendship compared to when friendship was not psychologically activated. Moreover, the interaction was positively correlated with compulsive buying tendency, meaning that the effect of friendship was stronger the higher participants' compulsive buying tendency. This is in line with our results from Experiment 1, where the psychological activation of friendship enhanced compulsive buyers' control implementation, as previous research has identified the DLPFC as the brain area involved with the actual inhibition of (consumption) impulses (Hare et al. 2009; Liddle et al. 2001; MacDonald et al. 2000; Menon et al. 2001). Liddle et al. (2001) for instance, found increased activation in the right Medial Frontal Gyrus during the successful inhibition of No-go trials in a Go/No-go task.

Table 3.2: Regions of interest showing statistically significant activation during inhibition trials as a function of friendship, product type and compulsive buying tendency

Location	Hemisphere	BA	MNI coordinates	Z-score	Cluster size (voxels)
ACC	*L*	24	-2, 34, 18	2.71**	137
ACC: Cingulate Gyrus	*R*	32	12, 14, 36	3.32***	79
ACC: Cingulate Gyrus	*L*	32	-2, 20, 36	3.30***	69
DLPFC	*R*	9	18, 52, 28	2.89**	2120
DLPFC: Medial Frontal Gyrus	*R*	9	6, 44, 22	2.87**	266

Note. x, y and z coordinates of the peak voxel in MNI coordinates. Z-scores correspond to local maxima within specific ROI. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 3.4: Regions of interest showing statistically significant activation during inhibition trials as a function of friendship, product type and compulsive buying tendency



Note. Significant activation in ACC and DLPFC (red and blue respectively; $Z > 2.0$, $p < .02$), based on 40 participants.

3.6.7.4 Discussion

When asked to inhibit their impulses towards buying temptations, participants showed increased activation in the ACC and DLPFC, brain areas closely associated with conflict identification and control implementation respectively, after the psychological activation of friendship compared to when friendship had not been psychologically activated. Hence, psychologically activating friendship seemed to increase activation in both neural systems constituting inhibition strength. Furthermore, the beneficial influence of friendship seemed to be particularly pronounced for compulsive rather than non-compulsive buyers. These findings support our findings from Experiment 1, providing more direct evidence that the psychological activation of friendship enhances compulsive buyers' capacity to identify conflict and implement control.

3.7 GENERAL DISCUSSION

Consumer self-control is considered a growing problem in today's society filled with consumption temptations (Dittmar 2005; Faber and O'Guinn 1992). Ultimately, consumers' difficulties with resisting consumption temptations may have negative consequences. Not only for the individuals themselves, but also for the society at large, as disturbed social relationships, severe financial debt and high healthcare costs are often reported results (Baumeister and Heatherton 1996; Faber and O'Guinn 2008; Finkelstein, Fielbelkorn, and Wang 2004; Rook 1987). The present research, however, demonstrates that all is not lost for consumers having problems with inhibiting consumption impulses. Rather than trying to reveal what critics have called the "buy button in the brain" (Editorial Nature Neuroscience 2004, p.683), the present research identifies a way to *stop* the brain from buying. Building on and extending previous research showing the impact of friendship on the experienced strength of (consumption) impulses (De Vries et al. 2013), the present research shows the beneficial influence of friendship on the other force involved in effective self-control: the self-regulatory mechanisms available to inhibit these impulses (Friese et al. 2011; Schmeichel et al. 2010). Doing this, we used a pre-validated measure to assess participants' inhibition strength (Go/No-go task; (Batterink et al. 2010; Liddle et al. 2001; Mishra and Mishra 2010; Newman et al. 1985; Yechiam et al. 2006) and focused on a group of consumers with trait self-control deficits: compulsive buyers.

In the first experiment, we provided preliminary evidence suggesting that the psychological activation of friendship significantly improves compulsive buyers' conflict identification and control implementation. Although compulsive buyers in whom friendship had not been psychologically activated demonstrated worse conflict identification and worse control implementation relative to non-compulsive buyers, psychologically activating friendship enhanced compulsive buyers' inhibition strength up to a level comparable to that of non-compulsive buyers.

In the second experiment we used functional Magnetic Resonance Imaging (fMRI) to obtain real-time observations of process (Huettel et al. 2009), providing more direct evidence for the beneficial influence of friendship on both processes constituting inhibition strength. As consumers' capacity to identify conflict and to implement control are closely associated with activation in the anterior cingulate cortex (ACC) and dorsolateral prefrontal cortex (DLPFC) respectively, we employed a region of interest (ROI) approach to examine the effect of the psychological activation

of friendship on these brain areas. The results showed that when consumers are confronted with buying temptations, psychologically activating the concept of friendship increases their activation in both the ACC and DLPFC. Moreover, the effect of friendship proved to be stronger the higher consumers' compulsive buying tendency. Hence, psychologically activating friendship seems to increase activation in both neural systems involved in effective impulse inhibition and this effect is particularly pronounced for compulsive rather than non-compulsive buyers. As such, the fMRI results provided converging evidence for our findings from the more rudimental, behavioral measures used in Experiment 1. That is, the psychological activation of friendship beneficially influences compulsive buyers' inhibition strength by improving both: their conflict identification and control implementation.

3.7.1 Scientific and Societal Relevance

The current research is one of the first that combines traditional approaches and imaging methods, allowing for observations of behavior as well as real-time observations of process (Huettel et al. 2009). As such, it provides unique insights and responds to a call by Wagner and Heatherton (2011, p. 55), asking for more research on the brain basis of self-control and "*what we can do to become better at it*". First, we shed further light on the role of the ACC and DLPFC in regulating (consumption) impulses (MacDonald et al. 2000). Moreover, we identified a way (the psychological activation of friendship) to influence these brain areas such that the self-control of consumers with trait self-control deficits can be enhanced. As such, our research is of both scientific and societal relevance.

The two stage model of cognitive control (Inzlicht and Gutsell 2007; MacDonald et al. 2000), conceptualizes inhibition strength as the product of two complementary, but distinct processes: conflict identification and control implementation. Consequently, the most effective way to enhance inhibition strength is likely one that improves both processes. In the present research we identified such an intervention and showed its effectiveness for compulsive buyers. Non-compulsive buyers likely possess sufficient inhibition strength for effective self-control (Vohs and Heatherton 2000), obviating the role of friendship.

The psychological activation of friendship increased compulsive buyers' average response latency and reduced their failures of inhibition on a Go/No-go task. Both measures are considered indicative of effective self-control in real-life situations

(Batterink et al. 2010). As a result, the psychological activation of friendship could be used in therapeutic frameworks to reduce compulsive buying tendencies and to improve self-control in other domains where problems with inhibiting impulses underlie the phenomenon, such as obesity and addiction.

Finally, previous research on the effectiveness of interventions aiming to improve conflict identification or control implementation is based on inferences from self-report measures (Hedgcock et al. 2012). The current research employs a more direct approach by directly measuring the impact of such an intervention on the associated brain areas. This is especially relevant as self-report measures may at best give estimations of what happens in the consumer brain, whereas fMRI provides direct insight in the relevant (brain) processes.

3.7.2 Limitations and Future Research

An often encountered limitation of neuroimaging research is its sample size. Because data collection is extraordinarily expensive (typically around $500 per hour) and time consuming, sample sizes in neuroscientific research tend to be small. Our sample size however, consisted of 40 participants. Equally divided in 20 compulsive and 20 non-compulsive buyers, this sample size is large compared with other fMRI studies (e.g., Dietvorst et al. 2009; Hedgcock and Rao 2009; Hedgcock et al. 2012; Yoon et al. 2006), including similar paradigms (Batterink et al. 2010).

Although our sample size is considered sufficient for acceptable reliability (Thirion et al. 2007), our sample is limited to female undergraduate students and results may thus not be generalizable to other demographic groups. Future research however could test whether similar results are found using males, older consumers, or consumers with different levels of education. Note however that around 90 percent of compulsive buyers are female (Dittmar et al. 2007; Dittmar et al. 2004) and that the age of our sample matches the onset age of compulsive buying (the late teens or early twenties; Black 2007; Schlosser et al. 1994), supporting the validity of our sample.

Inherent of the use of a repeated measures design in which a mindset activation procedure is used, is the existence of a confound. Unlike Batterink et al. (2010) we did counterbalance product type: we alternately used clothing as Go or No-go stimuli. However, the effect of the psychological activation of friendship was always measured by the last two Go/No-go tasks and as such may (in part) be caused by an order effect. Note however that the results of Experiment 2 are fully in line with our

findings from Experiment 1, where the use of a between-subjects design prevented the existence of confounds. This convergence in findings between both experiments makes an alternative explanation in terms of an order effect less likely.

Finally, care should be taken when inferring cognitive processes based on changes in brain activation. Since activity in a single brain area is associated with several processes, activation in a particular area is not incontrovertibly associated with a particular psychological process (Hedgcock et al. 2012). We consider this problem of reverse inference partially mitigated as our hypotheses center on well-defined areas of the brain (i.e., the ACC and DLPFC) which have reliably been implicated in conflict identification and control implementation (Hedgcock et al. 2012; MacDonald et al. 2000). Moreover, we used neuroimaging data (Experiment 2) to test predictions derived from actual behavior (Experiment 1), further mitigating the problem of reversed interference (Huettel et al. 2009).

Chapter 4

Friendship & Global Processing**

Imagine a consumer entering a shopping mall. On her way to the mall, she had been thinking about a recent experience in which she felt a strong connection with a dear friend. When she enters the mall, she is faced with several tempting consumption situations: she can smell the scent of cupcakes, she sees a pair of great looking shoes, and a salesperson informs her that the smart phone she has been wanting is currently on sale. How will her earlier thoughts about friendship affect her behavior in the mall?

In the current paper we extend previous research on social influences on consumption by focusing on how the psychological activation of friendship may promote consumer self-control in the face of consumption temptations. We suggest that making the construct of friendship salient in consumers' minds before they encounter a consumption situation may be a particularly effective way to reduce sensitivity to consumption temptations. In addition, we provide evidence that the psychological activation of friendship has its beneficial impact on self-control through its impact on a global processing style, the tendency to focus on the global, abstract or superordinate features of an object or situation (Trope and Liberman 2010).

Three studies suggest that the psychological activation of friendship may induce transcendence from the immediate consumption environment, allowing

** This chapter is based on De Vries, Eline L.E., Debra Trampe, and Bob M. Fennis (2013). "Friends Show Consumers the Forest Beyond the Trees: Friendship Enhances Consumer Self-Control by Promoting a Global Processing Style," working paper, University of Groningen

consumers to see beyond the alluring but subordinate features of consumption temptations. We find that this global processing style, in turn, promotes consumer self-control.

In the following sections, we will elaborate on our theorizing. We first review literature on how social influences may affect consumers. We will then discuss literature related to our hypothesis that friendship may induce a global processing style. Finally, we elaborate on the link between a global processing style and consumer self-control.

4.1 SOCIAL INFLUENCES ON CONSUMPTION

Social influence plays a major role in shaping consumers' cognitions, emotions, and behaviors. For example, consumer preferences may be very different depending on whether they are voiced in a private or a social consumption context (Ariely and Levav 2000; Ratner and Kahn 2002). Also, the presence of other people has been found to increase food intake (de Castro 1994) and serve as a source of information (Urbany, Dickson, and Wilkie 1989).

Recent research has investigated consumer responses to observing others' behavior. In general, there is evidence suggesting that viewing others exerting self-control or indulging in consumption temptations can spill over to the self. For example, Hofmann et al. (2012) found that observing others engaging in disinhibited behavior made it more likely for individuals to indulge as well. Also, participants who took the perspective of a hungry waiter trying hard to resist eating the delicious food s/he is serving were willing to pay more for a number of consumer products than participants who simply read about the waiter (Ackerman et al. 2009). The authors suggest that the self-control effort of the waiter may have vicariously depleted participants of their self-regulatory resources. Similarly, observing another person complete a goal may lead individuals to reduce their own striving toward that goal (McCulloch et al. 2011).

The research described above primarily deals with situations where the participant observes another person behaving in a certain way (e.g., exerting self-control or indulging). However, there are situations where we do not observe others behaving in any particular way; rather, a social entity may be merely present, without engaging in any form of overt behavior. In these cases, consumers have frequently been found to comply to the norms and values of the individual(s) who are merely

present in the consumption situation (Childers and Rao 1992; Hofmann et al. 2012; Rook and Fischer 1995). For example, insofar as family norms are associated with responsibility and peer norms with extravagance, respondents indicated that an imaginary shopper would be less likely to give in to a consumption temptation when the shopper was accompanied by family than when she was accompanied by peers (Luo 2005). Also, agency-oriented consumers (those consumers who emphasize the self and its distinctiveness from others) have been found to spend more when they are accompanied by a friend on their shopping trip compared to when they shop alone (Kurt, Inman and Argo 2011), presumably because agency-oriented consumers engage in self-promotion through increased spending in order to conform to the expectations that their friends have of them. Interestingly, even if consumers do not interact with other person(s) in the consumption situation, consumers may nonetheless be affected by the physical presence of the other person(s): Argo, Dahl and Manchanda (2005) observed that consumers were less likely to perform the 'uncool' behavior of using a battery-testing station when there were other shoppers in the store aisle than when they were alone. Moreover, work by Fitzsimons and Bargh (2003) suggests that others do not necessarily have to be physically present in order to affect consumers; rather, their findings suggest that the mere psychological presence of others may be sufficient to affect behavior. In their paper on interpersonal goals, the authors made their participants think of specific relationship partners (e.g., mother). The authors provided evidence that merely priming participants with significant others produced behavior in line with the goals associated with those significant others.

Thus, the current literature suggests that other people may not necessarily need to engage in active behavior nor be physically present in order to affect us. In the current research, we intend to push the envelope even further to investigate whether the psychological activation of the concept of friendship can increase consumer self-control when self-regulatory resources are low. As outlined above, past research has predominantly investigated consumption situations where others were physically present and/or engaging in a specific behavior. In contrast, in the current paper, we aim to extend existing research by investigating consumer behavior in consumption situations when the concept of friendship has been psychologically activated prior to entering the consumption situation. We suggest that having the concept of friendship on one's mind may produce outcomes in consumer cognitions and behavior that are different from the effects that have been documented when having friends by one's side. Thus, the effects of social presence on consumption and self-control

documented in the literature may not generalize to situations where consumers enter a consumption situation after having reflected on a dear friendship. More specifically, we suggest that when consumers' self-regulatory resources are low and the concept of friendship is activated, consumer self-control increases. We suggest that this might be so because the strong communal nature of friendship facilitates transcendence from the immediate consumption situation, enabling consumers to see beyond the lure provided by the concrete consumption temptations. We propose an increased global processing style as a result of reflecting on friendship as an underlying mechanism.

A number of findings reported in the literature lend credence to our hypothesis that the mere activation of friendship may increase self-control when self-regulatory resources are low. Although the authors did not focus on self-regulatory resource depletion and hence, did not manipulate self-control in their participants, findings reported by Zhang and Shrum (2009, study 2) seem consistent with our hypothesis. Studying how an interdependent versus independent self-construal affects impulsive consumption, these authors told participants that "enjoying relationships with family and friends is what it is all about" or that "enjoying life is what it is all about." The former prime produced less positive attitudes towards drinking beer than the latter. Insofar as being told that "life is all about enjoying relationships with family and friends" parallels the psychological activation of friendship, and indicating one's attitude towards drinking beer can be considered a proxy for impulsive consumption, this finding can be construed as supportive of our suggestion that the activation of the psychological construct of friendship increases consumer self-control. Also, Stillman et al. (2009) report that participants who had been primed with family displayed a number of behaviors that can be construed as involving self-control (e.g., solving math problems), although the prime did not consistently interact with self-regulatory resource depletion across studies.

In the present paper, we set out to provide direct evidence for our hypothesis that the psychological activation of friendship may promote consumer self-control in the face of consumption temptations. Moreover, we suggest that friendship may increase consumer self-control because the activation of the concept of friendship increases a global processing style. An increased global processing style, in turn, has been shown to increase self-control. In order to develop our theorizing, we will next elaborate on the relationship between friendship and a global processing style and then turn to the association between a global processing style and self-control.

4.2 FRIENDSHIP FACILITATES A GLOBAL PROCESSING STYLE

A global versus local processing style describes the way people look at or attend to objects or events (Förster, Liberman, and Shapira 2009). When confronted with a store full of chocolates for instance, consumers may either perceive the shop in its entirety, or they may attend to single chocolates available in the shop (Navon 1977). The former indicates a global processing style (i.e., a focus on the global, abstract or superordinate features of an object or situation), whereas the latter is an indication of a local processing style (i.e., a focus on local, concrete or subordinate features; Trope and Liberman 2010). In suggesting that the psychological activation of friendship may increase a global processing style, we draw on Clark and colleagues (Clark, Dubash, and Mills 1998; Clark and Mills 1979; Clark, Mills, and Powell 1986), who suggest that human relationships may be divided into communal and exchange relationships. Communal relationships are characterized by an emphasis on global needs and the general concern for each other's welfare, whereas exchange relationships center around the specific benefits that members give and receive from each other (Clark et al. 1998). In their work, Clark et al. consider friendship and family relations as strongly communal relationships, while relationships with coworkers, acquaintances and strangers score increasingly lower on communal relationship strength. Being less communal in nature, the latter relationships are gradually more inclined towards exchange relationships (Clark et al. 1998). This suggests that the strongly communal nature of friendship can be primarily characterized by a focus on abstract and global values and concerns rather than a focus on concrete or subordinate characteristics of the relationship. As a focus on abstract and global features is typically known as a global processing style (Trope and Liberman 2010), it is reasonable to assume that reminding consumers of friendship facilitates a global processing style. In contrast, relationships that are less communal in nature center more around concrete benefits of the relationship (Clark et al. 1998). The focus on concrete features makes it less likely that relationships that are far less communal in nature elicit the broad perspective that is characteristic of a global processing style. Indeed, research has found that when norms of a communal relationship are salient, brand attributes are evaluated at a higher level of abstraction than when norms of an exchange relationship are salient (Aggarwal and Law 2005).

Preliminary support for our hypothesis that friendship produces an increase in a global processing style can be found in findings reported by Förster, Özelsel,

and Epstude (2010). These authors suggest and find that love is related to a global processing style, whereas lust is related to a local processing style. Specifically, one of the control conditions in their study 1, in which participants were instructed to think about friendship, produced effects very similar to the love prime condition: both groups of participants displayed a larger temporal perspective than participants who were primed with lust. As temporal distance has been associated with a global and abstract processing style (Liberman and Trope 1998), this finding can be construed as an indication that the psychological activation of friendship increases a global processing style. Importantly, this "big picture perspective" that might be associated with friendship has also been linked to effective self-control (Schmeichel and Vohs 2009).

4.3 GLOBAL PROCESSING PROMOTES CONSUMER SELF-CONTROL

Failures at self-control occur when consumers prefer concrete and short-term gratifications over more abstract and long-term goals and values (Baumeister 2002). For instance, consumers may fail at self-control by eating a box of instantly available chocolates at the expense of their global and long-term goal of pursuing a healthy lifestyle. Research has shown that a local processing style promotes succumbing to consumption temptations, whereas resisting temptations and exercising effective self-control is generally facilitated by a global processing style (Fujita et al. 2006; Schmeichel, Vohs, and Duke 2011). A classic study by Mischel and Baker (1975) showed that attending to temptations as abstract objects (e.g., construing marshmallows as round white clouds), made it significantly easier to delay consumption (i.e., to exert self-control) relative to focusing on the concrete characteristics of consumption temptations (e.g., the sweetness and chewiness of the marshmallows). Similarly, Fujita et al. (2006) found that a global (vs. local) processing style is associated with several indications of self-control (e.g., decreased preferences for immediate vs. delayed outcomes, decreased evaluations of temptations). Low levels of self-regulatory resources in contrast, have been associated with a local processing style (Bruyneel and Dewitte 2012; Wan and Agrawal, 2011).

In conclusion, existing research finds that a global versus a local processing style is typically associated with higher self-control. Consequently, if our hypothesis that friendship facilitates global processing when self-regulatory resources are low

is correct, reminding consumers of friendship entails an interesting opportunity to counter consumption temptations.

4.4 PRESENT RESEARCH

In a series of three experiments we test our hypothesis that the psychological activation of friendship may promote consumer self-control in the face of consumption temptations by facilitating a global processing style. In experiment 1, we start with demonstrating that the psychological activation of friendship increases a global processing style, compared to a control condition. In experiment 2, we address the effect of a more versus less communal relationship on self-control and demonstrate that the facilitative effect of communal friendship is limited to conditions where self-regulatory resources are low. Finally, in the third and final experiment, we employ a more direct manipulation of low self-regulatory resources and replicate the results from experiment 2. Moreover, in experiment 3 we directly address the hypothesized mediating role of a global processing style. Specifically, we present findings supportive of our notion that the impact of friendship on self-control is mediated by increased global processing, thus providing converging evidence for our hypothesis.

4.5 EXPERIMENT 1

In the first experiment we started with examining the influence of friendship, a communal social relationship, on global processing. If our hypothesis that the psychological activation of friendship facilitates global processing is correct, participants should construe situations more abstractly (vs. concretely) after friendship activation compared to a control condition.

4.5.1 Participants and Design

Eighty-five male undergraduate students participated as part of a larger study, in exchange for money or partial course credit.

Four participants who were outliers on several key dimensions (e.g., having values greater than two standard deviations above or below the mean on mood or

time spent on the experiment; Hair et al. 2009) were removed from the analyses, as well as four that did not comply with instructions due to language difficulties. This resulted in an effective sample of 77 participants (mean age 18.61 years, SD = 0.98). The study used a single factor (friendship activation vs. control) between-subjects design.

4.5.2 Procedure

Upon arrival at the laboratory, participants were randomly assigned to one of two conditions. After signing an informed-consent form, they were individually seated in cubicles. Computer instructions told them that the study consisted of several unrelated tasks. The first task involved the friendship activation manipulation by means of an essay writing task (Stillman et al. 2009; Zhang and Shrum 2009). In the friendship condition, participants were instructed to describe a recent experience in which they felt a strong connection with a good friend. In line with the definition of friendship proposed by Sullivan (1953), we asked participants to write about a same-sex friend. In the control condition, participants were asked to describe the manufacturing process of a wooden table. All participants were asked to write at least five sentences and to be as accurate as possible in their description. We then measured participants' processing style. As relationship closeness and friendship quality are indicators of communal relationship strength (Clark and Mills 1993), participants in the friendship condition responded to the following items designed as manipulation checks: 'How close is the relationship with your friend?' and 'How strong do you consider the friendship with your friend?', both on a 7-point scale (1 = not at all, 7 = very). The average response to these items (α = .83) was used as an indicator of communal relationship strength. Finally, to account for potential mood effects, participants filled in the Positive and Negative Affect Schedule (PANAS; Watson, Clark, and Tellegen 1988) to assess current emotions.

4.5.3 Dependent Measure

The dependent variable of interest was participants' processing style, measured by the Behavior Identification Form (BIF; Förster et al. 2009; Vallacher and Wegner 1989). Although originally designed as a personality measure, the BIF has been shown to be sensitive to manipulations of psychological distance and has previously been used

as a dependent measure of processing style (Förster et al. 2009; Fujita et al. 2006; Liberman and Trope 1998; Wakslak et al. 2006). Composed of 25 items, each question requires participants to describe an activity (e.g., "eating") by choosing one of two options that represents the action abstractly (e.g., "getting nutrition") or concretely (e.g., "chewing and swallowing"). Choice of abstract descriptions represent a more global, as opposed to local, processing style.

Following Liberman and Trope (1998), the number of abstract choices served as our dependent measure. Each choice for abstract descriptions was scored as 1, whereas choices for concrete descriptions were scored as 0. Scores were summed for each participant and sum scores ranged from 7 to 24.

4.5.4 Results and Discussion

4.5.4.1 Manipulation check

A one-sample t-test using the scale's middle point as a benchmark confirmed that participants in the friendship condition perceived the friendship they wrote about as strongly communal (M = 5.61; SD = 1.11; $t(34) = 11.25$, $p < .001$). The manipulation of friendship as a communal social relationship can thus be considered successful.

4.5.4.2 Mood

The manipulation did not affect participants' positive or negative affect scores ($ts < 1$). As our manipulations produced neither main or interaction effects on mood in the other two experiments reported in the paper, mood will not be discussed further.

4.5.4.3 BIF scores

An independent-samples t-test showed that participants in the friendship condition construed situations more abstractly (M = 14.91, SD = 3.67) than participants in the control condition (M = 13.10 and SD = 4.14; $t(75) = 2.02$, $p < .05$). This suggests that being reminded of friendship, a social relationship that is communal in nature, facilitates global processing, compared to a non-social control condition.

4.6 EXPERIMENT 2

Experiment 1 provides support for our hypothesis that psychologically activating the concept of friendship (compared to a control condition) promotes a global processing style. Experiment 2 builds on these results and has three primary objectives: First, we directly investigate the hypothesized causal link between the psychological activation of friendship and consumer self-control. Second, in order to rule out the possibility that any effects are caused by being reminded of interpersonal relationships in general rather than friendship per se, we added a condition in which participants are reminded of a social relationship that is far less communal in nature than friendship. Third, per our hypothesis that friendship promotes self-control through facilitating a global processing style, the effect of friendship should be more pronounced under or limited to conditions of local rather than global processing (i.e., under conditions of low self-regulatory resouces; Bruyneel and Dewitte 2012; Wan and Agrawal, 2011).

4.6.1 Participants and Design

Two hundred forty-eight undergraduate students participated as part of a larger study, in exchange for money or partial course credit. Sixteen participants who were outliers on several key dimensions (e.g., having values greater than two standard deviations above or below the mean on mood or time spent on the experiment; Hair et al. 2009) were removed from the analyses, as well as eight that failed to comply with experimental instructions. This left an effective sample of 224 participants (65.2% male; mean age 20.24 years, SD = 1.99).

The study used a 2 (processing style: local vs. global) × 3 (communal relationship strength: friendship vs. fellow student vs. control) between-subjects factorial design.

4.6.2 Procedure

Upon arrival at the laboratory, participants were randomly assigned to one of six conditions. After signing an informed-consent form, participants were individually seated in cubicles. Computer instructions told them that the experiment consisted of several unrelated tasks. The first task involved the manipulation of processing style. We manipulated processing style by means of the Navon task (Förster, Liberman, and

Kuschel 2008; Macrae and Lewis 2002; Navon 1977), in which participants were shown a series of composite letters (a big letter made up of smaller letters). Participants were required to report either the composite (global processing condition) or the smaller letters (local processing condition). The second task (the social relationship activation procedure) consisted of an essay writing task similar to experiment 1. The control condition was identical to experiment 1, asking participants to describe the manufacturing process of a wooden table. To keep instructions consistent across conditions in experiment 2, we slightly adapted the instructions of the friendship condition. Participants in the friendship condition were now asked to describe in detail their profound relationship with a good friend. In addition, to disentangle the effect of thinking about friendship from thinking about any social relationship, we added a condition in which participants described a social relationship that is more exchange than communal in nature. That is, participants in this condition were asked to describe their relationship with a fellow student they only knew superficially from working on joint course assignments, but were not friends with. All participants were asked to write at least five sentences and to be as accurate as possible in their description. In the friendship and fellow student condition, participants were asked to write about a same-sex other with whom they have a non-sexual relationship.

Next, as an indicator of self-control, we measured participants' preference for immediate over delayed consumption (adapted from Fujita et al. 2006). In line with experiment 1, as a manipulation check, participants in the friendship and fellow student conditions were asked about the closeness of the relationship with the person they wrote about. In addition, as communal relationships are typically one's most important relationships (Clark and Mills 1993) the following item was added: 'How important is this person for you?' Both manipulation checks items were answered on a 7-point scale (1 = not at all, 7 = very). The average of the two items (α = .95) was used as an indicator of communal relationship strength.

4.6.3 Dependent Measure

To measure consumer self-control we showed participants photos of six hedonic products (i.e., clothing, shoes, a cupcake). Following the procedure of Fujita et al. (2006), participants indicated the amount that they would pay to receive the product (a) immediately and (b) delayed in time (i.e., 6 months later). For each product, we computed difference scores by subtracting the value that participants were willing to

pay for delayed consumption of the product from the amount they were willing to pay for immediate consumption. We summed the difference scores to form a composite measure of preference for immediate over delayed consumption. Higher scores indicate stronger preference for immediate over delayed consumption and hence lower self-control.

4.6.4 Results and Discussion

4.6.4.1 Manipulation check

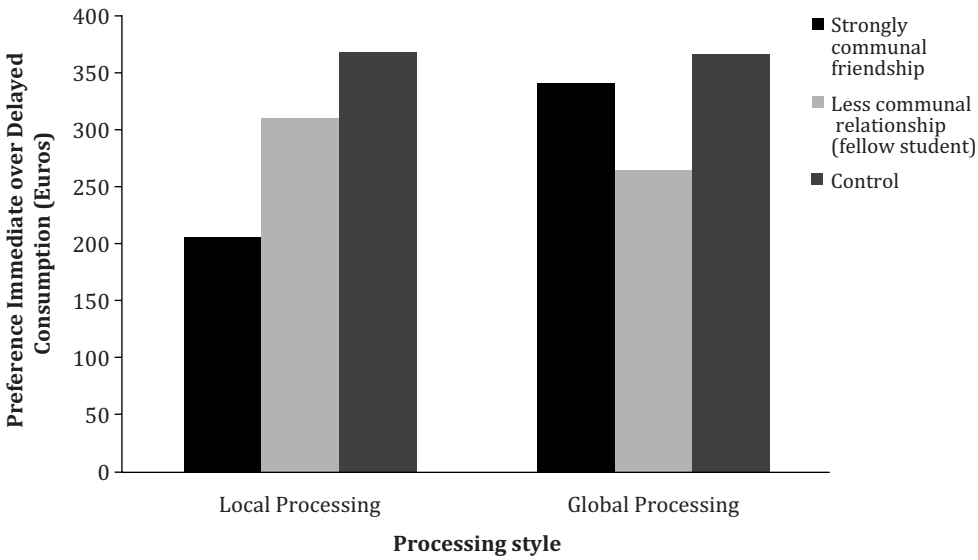
An independent-samples t-test showed that participants in the friendship condition considered the relationship they had written about as more communal (M = 5.85, SD = 1.06) than participants in the fellow student condition (M = 1.82, SD = 0.71; $t(142) = 26.94$, $p < .001$), confirming the effectiveness of our manipulation of communal relationship strength.

4.6.4.2 Preference for immediate over delayed consumption

An ANOVA on the preference for immediate over delayed consumption as a function of processing style and communal relationship strength showed no main effect of processing style ($F(1, 218) = 1.02$, NS). There was a significant main effect of communal relationship strength ($F(2, 218) = 4.18$, $p < .05$), participants in the friendship condition showing less preference for immediate over delayed consumption (M = 280.39 Euros, SD = 223.42) than participants in the control condition (M = 368.06 Euros, SD = 239.61; LSD [least significant difference], $p < .05$), but not compared to the fellow student condition (M = 287.42 Euros, SD = 186.01; LSD, NS). More importantly, the interaction between processing style and communal relationship strength was significant ($F(2, 218) = 3.40$, $p < .05$). Analysis of the simple main effects showed that the effect of communal relationship strength on preference for immediate over delayed consumption was significant for participants with a local processing style ($F(2, 218) = 5.01$, $p < .01$). In line with predictions, participants with a local processing style showed lower preference for immediate over delayed consumption in the friendship condition (M = 207.03 Euros, SD = 193.87) compared to both the fellow student (M = 311.37 Euros, SD = 186.54; LSD, $p < .05$) and control condition (M = 369.05 Euros, SD = 197.56; LSD, $p < .01$). In contrast, participants in the fellow student condition did not show lower preference for immediate over delayed consumption compared to the control condition (LSD, NS). Communal relationship

strength did not influence the preference of participants in the global processing condition ($F(2, 218) = 2.36$, NS; see Figure 4.1).

Figure 4.1: Preference of immediate over delayed consumption as a function of processing style and communal relationship strength



4.6.4.2 Discussion

Psychologically activating a social relationship that is strongly communal in nature (friendship), compared to a social relationship that is far less communal in nature (a fellow student) led participants with a local processing style to reduce their preference for immediate over delayed consumption. Thus, experiment 2 found support for our hypothesis that psychologically activating the concept of friendship promotes consumer self-control in the face of consumption temptations. Importantly, we only observed this effect when participants had a local but not global processing style, lending credence to our hypothesis that psychologically activating friendship increases self-control because friendship increases a global processing style. Finally, we added a condition in which participants are reminded of their relationship with a same-sex fellow student they only know superficially from working on joint course

assignments, but were not friends with. Such a relationship would be characterized as far less communal in nature than friendship (Clark et al. 1998). The finding that under conditions of local processing, consumer self-control increased after thinking about friendship compared to a fellow student makes it unlikely that the effect of friendship would be the result of activating any social relationship, rather than friendship per se.

4.7 EXPERIMENT 3

In the first experiment we showed that friendship facilitates a global processing style. In the second experiment we showed that under conditions that are typically associated with low self-regulatory recourses (i.e., a local processing style), friendship facilitates self-control. In experiment 3 we aimed to provide converging evidence for these findings by employing a more direct manipulation of self-regulatory resource availability and addressing the mediating role of a global processing style in the relationship between the psychological activation of friendship and consumer self-control.

4.7.1 Participants and Design

One hundred ninety-nine undergraduate students participated as part of a larger study, in exchange for money or partial course credit. Twenty-three participants (11%) were removed from the analyses: 10 of them being outliers on several key dimensions (e.g., having values greater than two standard deviations above or below the mean on mood or personality traits, or values greater than 3.5 standard deviations above or below the mean on the dependent variable; Hair et al. 2009), 11 did not comply to or failed to pay sufficient attention to experimental instructions (Oppenheimer, Meyvis and Davidenko 2009), one failed to complete all measures and one because of language difficulties. This resulted in an effective sample of 176 participants (50% male; mean age 21.10 years, SD = 2.52).

The study used a 3 (communal relationship strength: friendship vs. fellow student vs. control) × 2 (self-regulatory resource depletion: depletion vs. no depletion) between-subjects factorial design.

4.7.2 Procedure

Upon arrival at the laboratory, participants were randomly assigned to one of six conditions. After signing an informed-consent form, participants were individually seated in cubicles, where computer instructions told them that the experiment consisted of several unrelated tasks.

The first task consisted of the same essay writing task as in experiment 2. We then proceeded with the self-regulatory resource depletion manipulation using the e-circling task we adopted from Baumeister et al. (1998). All participants were given two sheets of paper describing the life of an unknown artist. In the no-depletion condition the text was printed in regular black, whereas in the depletion condition the text was printed in light grey, making the text more difficult to read. First, all participants were instructed to cross off all letters *e*. After completing the first sheet, participants in the no-depletion condition continued with this task on the second sheet of paper. Participants in the depletion condition, in contrast, were instructed to only cross off letters *e* that satisfied certain conditions (e.g., not followed or preceded by a vowel). Participants in the depletion condition thus had to inhibit the impulse of crossing out every *e*, and apply complex rules. Previous research has shown that these two conditions produce significant differences in the availability of self-regulatory resources (Baumeister et al. 1998; Fennis, Janssen, and Vohs 2009).

After the self-regulatory resource manipulation, we assessed participants' global processing style with the Kimchi-Palmer task (Gasper and Clore 2002; Kimchi and Palmer 1982), which was described to participants as a response time task. After this task, participants viewed an image of a cupcake and indicated the amount they were willing to pay for it. Finally, we used the same manipulation checks as in experiment 2. That is, on a 7-point scale (1 = not at all, 7 = very), we asked participants about relationship closeness and the personal importance of the person they wrote about. The average of the two items ($\alpha = .93$) was used as an indicator of communal relationship strength.

4.7.3 Dependent Measures

4.7.3.1 Kimchi-Palmer task

To measure participants' global processing style we used the Kimchi-Palmer task (Gasper and Clore 2002; Kimchi and Palmer 1982). In each trial, participants were

asked to indicate as quickly as possible which of two sample figures looked most like a target figure. A target figure was made up of smaller figures (e.g., a triangle made up of small squares). One of the two sample figures shared local but not global features of the target figure (e.g., a square made up of squares) whereas the other sample figure shared global but not local features (e.g., a triangle made up of triangles). The complete task consisted of 24 trials. Choice of predominantly local sample figures indicates a local processing style, whereas choice of global sample figures reflects global processing. Each global choice was scored as 1, whereas local choices were scored as 0. The number of global choices served as our measure of global processing. Sum scores, computed for each participant, ranged from 0 to 24.

4.7.3.2 Willingness-to-pay

To measure self-control, we showed participants a photo of a chocolate-and-vanilla cupcake and asked them how much they would be willing to pay for the cupcake at that specific moment.

4.7.4 Results and Discussion

4.7.4.1 Manipulation check

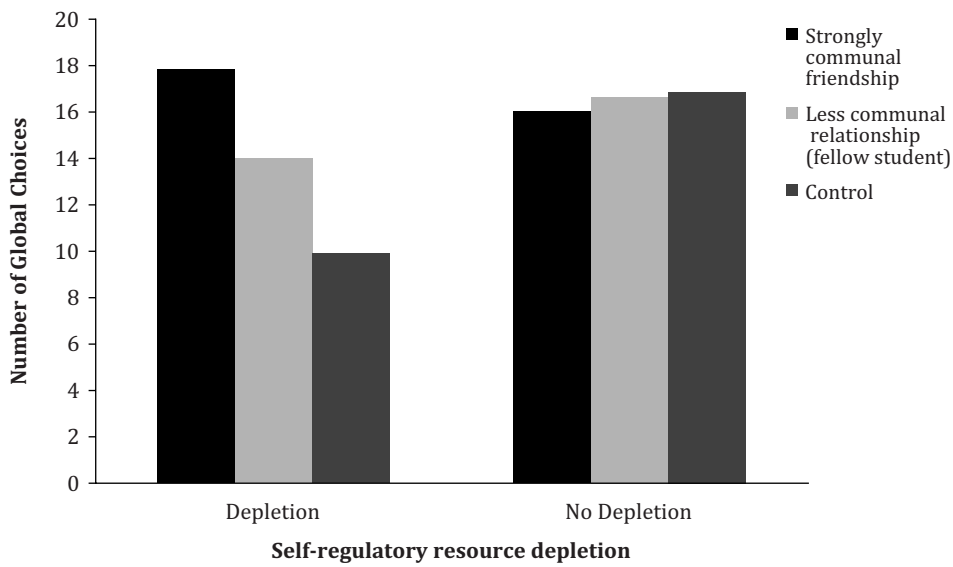
As in experiment 2, an independent-samples t-test showed that participants in the friendship condition considered the relationship as more communal (M = 5.36, SD = 1.45) than participants in the fellow student condition (M = 2.22, SD = 0.94; $t(124) = 14.93, p < .001$), confirming the effectiveness of our manipulation of communal relationship strength.

4.7.4.2 Number of global choices

An ANOVA conducted on the number of global choices as a function of communal relationship strength and self-regulatory resource depletion showed a significant main effect of communal relationship strength ($F(2, 170) = 3.21, p < .05$). As expected, reminding participants of friendship enhanced global processing ($M = 17.07$, SD = 6.65) compared to the fellow student ($M = 15.35$, SD = 8.02) and control ($M = 13.39$, SD = 8.53) conditions. There was also a main effect of depletion ($F(1, 170) = 5.21, p < .05$). In line with research showing that self-regulatory resource depletion facilitates local processing (Bruyneel and Dewitte 2012; Wan and Agrawal 2011), participants in the depletion condition made fewer global choices (M = 14.72, SD = 8.25) than

participants in the no-depletion condition (M = 16.48, SD = 7.02). Most importantly, the interaction between communal relationship strength and self-regulatory resource depletion also proved significant ($F(2, 170) = 4.97$, $p < .01$). Analysis of the simple main effects showed that the effect of communal relationship strength on global processing was only significant for participants whose self-regulatory resources had been depleted by the e-circling task ($F(2, 170) = 8.67$, $p < .001$). In line with our expectations, depleted participants in the friendship condition made more global choices (M = 17.83, SD = 6.29) compared to both depleted participants in the fellow student (M = 14.00, SD = 8.89; LSD, $p < .05$) and control condition (M = 9.91, SD = 8.40; LSD, $p < .001$). The difference in number of global choices between the fellow student and control condition was marginally significant (LSD, $p < .10$). In the no depletion condition, communal relationship strength did not influence the number of global choices participants made ($F < 1$; see Figure 4.2).

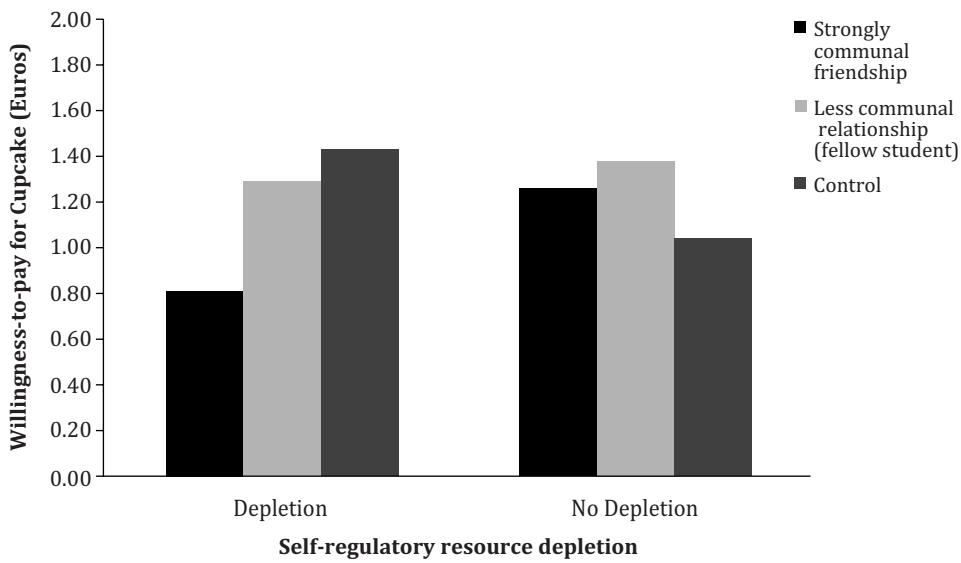
Figure 4.2: Global processing as a function of self-regulatory resource depletion and communal relationship strength



4.7.4.3 Willingness-to-pay

An ANOVA conducted on the willingness-to-pay for a cupcake as a function of communal relationship strength and self-regulatory resource depletion showed no main effects of communal relationship strength ($F(2, 170) = 2.07$, NS) and depletion ($F < 1$). However, the interaction between communal relationship strength and self-regulatory resource depletion proved significant ($F(2, 170) = 3.40$, $p < .05$). Analysis of the simple main effects showed that the effect of communal relationship strength on willingness-to-pay was only significant for participants whose self-regulatory resources had been depleted ($F(2, 170) = 4.87$, $p < .01$). In line with the results on global processing, depleted participants in the friendship condition ($M = 0.81$ Euros, SD = 0.74) were willing to pay less for the cupcake compared to depleted participants in the fellow student ($M = 1.29$, SD = 0.90; LSD, $p < .05$) and control condition ($M = 1.43$, SD = 0.79; LSD, $p < .01$). In contrast, the difference between depleted participants in the fellow student and control condition was not significant (LSD, NS). When self-regulatory resources were intact, communal relationship strength did not influence willingness-to-pay ($F(2, 170) = 1.01$, NS; see Figure 4.3).

Figure 4.3: Willingness to pay for a cupcake as a function of self-regulatory resource depletion and communal relationship strength



4.7.4.4 Mediation analysis

To assess whether a global processing style mediates the impact of communal relationship strength and self-regulatory resource depletion on willingness-to-pay for a cupcake (i.e., consumer self-control), a moderated mediation analysis was performed following recommendations by Preacher, Rucker, and Hayes (2007; see also Zhao, Lynch, and Chen 2010). A bootstrap analysis (5000 resamples) showed that the influence of the communal relationship strength × depletion interaction on willingness-to-pay is mediated by the number of global choices (95% confidence interval, excluding zero: [-0.17, -0.02]).

4.7.4.5 Discussion

Consistent with experiment 2, the effects of friendship were limited to conditions of low self-regulatory resources. Under these circumstances, participants who were reminded of friendship showed stronger signs of a global processing style compared to participants who were reminded of a fellow student or were not reminded of an interpersonal relationship at all. Importantly, these effects were mirrored in our measure of consumer self-control: when self-regulatory resources were low, the psychological activation of friendship was associated with a lower willingness to pay than thinking about a fellow student or not thinking about any social relationship. This suggests that the effects of friendship on self-control are more likely to be caused by the specific communal nature of friendship, rather than by the social nature of friendship. Moreover, a moderated mediation analysis showed that the effects of friendship on self-control were mediated by a global processing style. This provides support for our hypothesis that the psychological activation of friendship increases consumer self-control because friendship enhances global processing.

4.8 GENERAL DISCUSSION

While years ago, consumers' potential shopping activities were limited to eight hours a day, the 24/7 economies of today's society present a never-ending stream of consumption opportunities that may invite impulsive consumption. In the literature, impulsive consumption has been characterized as a conflict between the competing strengths of desire and self-control (Baumeister 2002; Hoch and Loewenstein 1991), and difficulties with resisting consumption temptations have been associated with

negative consequences such as financial and social problems (Baumeister 2002; Rook and Fisher 1995; Vohs and Faber 2007). The present paper identified the psychological activation of friendship as a beneficial influence on consumer self-control in situations where giving in to one's impulses would otherwise be the likely outcome (i.e., when self-regulatory resources are low). In three experiments, we find evidence for our hypothesis that when self-regulatory resources are low, the psychological activation of friendship facilitates consumer self-control because friendship increases a global processing style. Specifically, experiment 1 finds that the activation of friendship (vs. a control condition) leads participants to construe situations more abstractly, which is a strong indicator of a global processing style (Förster et al 2009; Fujita et al. 2006; Liberman and Trope 1998; Wakslak et al. 2006). Moreover, when we experimentally induced a global versus a local processing style, friendship increased self-control only among participants who processed locally (experiment 2). In experiment 3, we obtained direct evidence for the mediating role of global processing by finding that the increase in global processing style mediated the increase in self-control after psychologically activating the concept of friendship when self-regulatory resources were low.

An alternative explanation for the facilitative effect of friendship on self-control could be that the psychological activation of any social relationship is sufficient to increase self-control. We addressed this issue by adding a condition to our design in which participants were reminded of a social relationship that is far less communal in nature than friendship (i.e., a fellow student they have worked with but whom they do not consider a friend). In line with our hypothesis that it is the communal, and not the social nature of friendship that increases a global processing style and subsequently, self-control, reminding participants of a fellow student produced levels of a global processing style and self-control similar to a non-social control condition. Also, we were able to rule out the potential confounding role of mood that may theoretically be associated with psychologically activating the concept of friendship, as our friendship manipulation did not covary systematically in any of our studies. Taken together, the findings from the three studies reported here are supportive of our hypothesis that when self-control is low, psychologically activating the concept of friendship can enhance self-control by inducing a global processing style.

The present studies build on several lines of existing research. First, we add to studies on social influences on consumption. Existing research on social influences mainly focused on how consumers respond to the norms that the presence of others

in a consumption situation may (implicitly) signal (e.g., Argo et al. 2005; Kurt et al. 2011; Luo 2005; Rook and Fischer 1995). We contribute to this literature by focusing not on situations where consumers have others by their side, but rather, situations where consumers have others on their minds. While previous research suggests that the physical presence of friends may generally increase consumption (de Castro 1994; Luo 2005; Zhang and Shrum 2009), the current research finds that the psychological activation of the concept of friendship on the other hand, may decrease consumption when self-regulatory resources are low. While the psychological activation of friendship increases a global processing style, arguably because friendship is considered a communal social relationship that is associated with an emphasis on global needs and a general concern for the other person, the existing literature suggests that the (physical) presence of friends induces normative and impression management concerns in consumers. We speculate here that in that case, consumers are likely to be concerned with the behavioral and attitudinal standards that are appropriate at this specific moment. A focus on the here and now is generally associated with a local processing style (Liberman and Trope 1998). Future research might address the validity of the role of a local processing style in consumption situations where consumers are accompanied by friends.

Second, earlier research has primarily examined how self-control affects the quality and dynamics of social relationships (Finkel and Campbell 2001; Finkel and Fitzsimons 2011; Fitzsimons and Finkel 2011; Righetti and Finkenauer 2011; Vohs, Finkenauer, and Baumeister 2011). However, research investigating the effect of social relationships on self-control has been scant (Baumeister et al. 2005; Finkel and Fitzsimons; Stillman et al. 2009). By examining the effect of friendship on consumer self-control, the current research thus adds to the literature on the influence of social relationships on self-control. In addition, by identifying that the psychological activation of friendship increases consumer self-control when self-regulatory resources are low, the current research also adds to a growing body of literature that focuses on factors that facilitate, rather than impede, self-control (Dewitte, Bruyneel, and Geyskens 2009; Martijn et al. 2007; Muraven and Slessareva 2003; Schmeichel and Vohs 2009).

Third, the present work also relates to previous research that has documented that friendship is important in facilitating well-being, including positive adjustment, health, prosocial behavior, and self-esteem (Bishop and Interbitzen 1995; Krause and Wulff 2005; Lakey and Orehek 2011; Schwartz et al. 2000; Sullivan 1953). The

present research contributes to this stream by providing evidence that even the mere psychological activation of friendship may increase consumer self-control. This is important, considering that a lack of self-control has been associated with various negative outcomes (Baumeister 2002; Rook and Fisher 1995; Vohs and Faber 2007).

Fourth, the current research relates to construal level theory (Liberman and Trope 1998), by replicating the finding that a local processing style (i.e., low level construals) are associated with low self-control (Fujita et al. 2006; Schmeichel et al. 2011). Perhaps the current studies are most relevant to research that links construal level theory to interpersonal relationships. In particular, Förster et al. (2010) suggest that because love is more related to 'foreverness' and hence, the distant future, love is related to a global processing style. Lust, in contrast, is more focused on the here and now and as a consequence, is more related to a local processing style, according to the authors. The authors find general support for their hypothesis; however, they also observed that their friendship control condition produced results very similar to love with regard to processing style. They speculate that this may be because both love and friendship may trigger long distance goals. The current studies, however, suggest that it might be the communal nature of both friendship and love that may have produced similar effects.

Finally, the present research relates to research on communal and exchange relationships by being among the very few studies that have demonstrated the relevance of the distinction in the field of consumer behavior (Aggarwal 2004; Aggarwal and Law 2005). In construal level theory, psychological closeness is associated with lower rather than higher level construals (Trope and Liberman 2010). Hence, it is important to note that although communal relationships tend to be correlated with subjective closeness of the relationship, communal relationships go beyond the notion of closeness (Clark and Mills 1993). In addition to being close relationships, the core of communal relationships consists of an emphasis on global needs and a general concern for the other person. It is this focus on abstract and global concerns that we suggest to play a key role in inducing global processing. In sum, in the current research, we made an effort to build on and contribute to various research streams. We identified the psychological activation of friendship as a potent factor to increase consumer self-control. It seems that by heightening their global processing style, the concept of friendship shows consumers the proverbial forest beyond the trees, and as such, substantially enhances self-control.

Chapter 5

General Discussion

Consumer self-control is considered a growing problem in today's society filled with consumption temptations (Dittmar 2005; Faber and O'Guinn 1992). While years ago, consumers' potential shopping activities were limited to eight hours a day, the 24/7 economies of today's society continuously evoke consumption impulses that may be difficult to resist. This is especially alarming as failures to override consumption impulses lie at the heart of many problematic consumer behaviors (Baumeister 2002; Baumeister and Heatherton 1996; Faber and Vohs 2011; Friese, Hofmann, and Wiers 2011). Consumers may fail to control impulses to buy (Faber and Vohs 2011; Rook 1987), eat unhealthy food, drink alcohol, or smoke cigarettes (Friese et al. 2011). The present research, however, demonstrates that all is not lost for consumers having difficulties with inhibiting consumption impulses. In the current dissertation, I identified friendship as a potent factor to increase consumers' self-control. More specifically, I showed that the psychological activation of friendship improves both sides of the self-control struggle (Friese et al. 2011; Schmeichel, Harmon-Jones, and Harmon-Jones 2010): it reduces the strength of consumption impulses and enhances the strength to inhibit these impulses.

I conducted nine studies, the majority of which was behavioral experimental in nature, while one study used functional Magnetic Resonance Imaging (fMRI) in order to examine consumers' brain activation. As such, the current research is one of the first that combines traditional approaches and imaging methods, allowing for

observations of behavior as well as real-time observations of process (Huettel et al. 2009).

In the remainder of this chapter, I will give an overview of the main findings, discuss the societal and scientific implications and conclude with suggestions for further research.

5.1 MAIN FINDINGS

5.1.1 Friendship Reduces Impulse Strength

In Chapter 2, I identified friendship as a factor that increases consumer self-control. I showed that consumers are better able to exert self-control (i.e., are less inclined towards impulsive consumption) when the concept of friendship is psychologically activated. I demonstrated this finding among consumers in general, although the effect was particularly pronounced for consumers chronically or temporarily low in self-control (i.e., compulsive buyers or depleted consumers respectively). In addition, mediation analyses revealed that a reduction in the experienced strength of consumption impulses underlies the friendship effect on self-control in the face of consumption temptations. By reducing impulse strength, the psychological activation of friendship makes consumption impulses easier to overcome, and thus, impulsive consumption less likely. Hence, Chapter 2 provided evidence that friendship improves the *impulse strength* side of the self-control struggle.

5.1.2 Friendship Enhances Inhibition Strength

After having examined the impact of friendship on impulse strength, in Chapter 3 I continued with examining the influence of friendship on the second force involved in maintaining or restoring consumer self-control: *inhibition strength*. In two studies, I used a validated measure of consumers' inhibition strength (Go/No-go task; Batterink, Yokum and Stice 2010; Liddle, Kiehl, and Smith 2001; Newman, Widom and Nathan 1985; Mishra and Mishra 2010; Yechiam et al. 2006). The results of the first study, a behavioral experiment, provided preliminary evidence that the psychological activation of friendship enhances the inhibition strength of compulsive buyers, by improving their capacity to identify conflict and to implement control. Using fMRI,

which allows for real-time observations of process (Huettel et al. 2009), I continued with studying more directly whether friendship enhances inhibition strength by improving conflict identification and/or control implementation. That is, whether the psychological activation of friendship enhances activation in one or both of the associated brain areas: the ACC and/or DLPFC respectively. The results of the fMRI study converged with the findings of the behavioral experiment, providing compelling evidence that friendship enhances the inhibition strength of consumers (chronically) low in self-control by improving both processes that constitute inhibition strength: it facilitates conflict identification *and* control implementation.

5.1.3 Friendship Enhances Global Processing

In Chapter 4, I revealed global processing as an (additional) underlying mechanism driving the friendship effect on self-control. More specifically, I showed that the psychological activation of friendship induces transcendence from the immediate environment, allowing consumers to see beyond the alluring but subordinate features of consumption temptations. This global processing style, in turn, promoted consumers' self-control. In line with the findings in the previous chapters, the friendship effect appeared with low self-control consumers and did not occur when consumers were reminded of a far less communal social relationship.

5.1.4 Friendship Effect Across Manipulations, Measures and Consumers

The beneficial effect of friendship on self-control that I observed in the current dissertation seems rather robust. Across the three empirical chapters, I used four different manipulations to psychologically activate friendship: (1) the actual, physical presence of a close friend, (2) the imagined presence of a close friend, (3) an established mindset activation procedure in the form of an essay writing task and (4) an oral version of this task. I also used several measures, indicators and behaviors to gauge consumer self-control. Strikingly, across all studies, the mere psychological activation of friendship was sufficient for the beneficial effects to surface with consumers (chronically or temporarily) low in self-control. Moreover, although the findings presented in this dissertation suggest that the beneficial influence of friendship is particularly pronounced with these consumers (chronically or temporarily) low in self-control, it is worth mentioning that the mere physical presence of a close friend

– arguably the most direct manipulation of friendship – produced a positive effect on *all* participants' self-control.

5.2 SOCIETAL AND SCIENTIFIC IMPLICATIONS

Even though self-control failure in the consumption domain has been associated with various negative outcomes and is considered a growing problem (Baumeister 2002; Dittmar 2005; Rook and Fisher 1995; Vohs and Faber 2007), the majority of research on consumer self-control has focused on factors that decrease rather than facilitate self-control (Ackerman et al. 2009; Baumeister et al. 2005; Finkel et al. 2006; Rook and Garner 1993; Tice and Bratslavsky 2000; Vohs and Faber 2007). Hence, research on factors that may enhance rather than impede consumers' self-control is both of societal and scientific relevance.

More specifically, the findings reported in this dissertation have important implications for consumer wellbeing, since (the psychological activation of) friendship as a mechanism to enhance the self-control of compulsive buyers, may contribute directly to interventions addressing this societal problem. Similarly, reminders of friendship could be used in therapeutic frameworks to improve self-control in other domains where problems with inhibiting (consumption) impulses underlie the phenomenon, such as obesity and addiction. Also, policy makers could advise consumers to put a photo of a good friend in their wallet, reminding them of friendship at specifically those moments they have difficulties resisting consumption temptations. Likewise, putting a friendship reminder in the cookie jar could be an effective advise to consumers with weight problems. Furthermore, (governmental) commercials building associations between tempting products and friendship may also be a way to moderate their consumption. Finally, illustrations or quotes about friendship on packaging may also enhance the self-control of consumers normally particularly vulnerable to overconsumption of these temptations. Leaving consumers with sufficient levels of self-control likely unaffected, the use of friendship reminders may be an unique way to enhance consumer well-being without killing company sales.

Extending previous research showing the beneficial influence of friendship for health and well-being (including positive adjustment, prosocial behavior, and self-esteem; Bishop and Interbitzen 1995; Krause and Wulff 2005; Lakey and Orehek, 2011; Schwartz, Dodge, Petit, and Bates 2000; Sullivan 1953), the present research

contributes also scientifically by showing the beneficial influence of friendship on consumer self-control. Moreover, both sides of the self-control struggle have been empirically examined, one of which has received relatively little attention in the literature (i.e., impulse strength; Schmeichel et al. 2010).

Furthermore, an fMRI study has been performed on the impact of friendship on two brain areas reliably associated with inhibition strength. This provided unique insights in the beneficial influence of friendship and responds to Wagner and Heatherton (2011, p. 55), who called for more research on the brain basis of self-control and "*what we can do to become better at it.*"

A final contribution of the current research concerns the conceptualization of low self-control. I manipulated low self-control by identifying consumers as compulsive buyers or by manipulating self-regulatory resource depletion. In doing so, I connected the compulsive buying literature with literature on self-control failure by ego depletion. This is particularly relevant as researchers have not yet agreed on whether compulsive buyers should be seen as qualitatively different from regular consumers (i.e., having a psychological disorder; Friese 2000; O'Guinn and Faber 1989) or whether they simply differ in terms of quantity (i.e., an extreme manifestation of more modal buying behavior; d'Astous, Maltais, and Roberge 1990; Dittmar, Long, and Bond 2007; Nataraajan and Goff 1992). Although the compulsive buyers used in these studies were all identified in the general population, and as such, might be more accurately characterized as more general 'excessive buyers' rather than consumers having a clinically diagnosable compulsive buying disorder (Faber and O'Guinn 2008), the current research may hold valuable insights for this on-going debate. While I acknowledge the nature of the sample, the convergence of findings between compulsive buyers and depleted consumers may suggest a more quantitative rather than qualitative difference between both groups of consumers.

5.3 FUTURE RESEARCH PERSPECTIVES

In this penultimate section, I provide a number of topics that I think are interesting to study in future work. In Chapter 4, I showed that reminding consumers low in self-control of friendship enhances their global processing style, which in turn, enhances their self-control. Further research is needed to shed light on whether global processing improves consumer self-control by reducing impulse strength and/

or enhancing inhibition strength. Shifting attention away from concrete, but alluring features of consumption temptations may suggest a reduction in impulse strength. Besides, global as opposed to local processing facilitates decision-making and behavior consistent with long-term goals rather than short-term gratification (Fujita and Sasota 2011). This may suggest that global processing facilitates inhibition strength by improving consumers' capacity to identify the existence of self-control conflict (i.e., by enhancing activation in the ACC).

Furthermore, future research could explore boundary conditions for the beneficial impact of friendship on self-control. This is especially relevant as previous research has suggested that the physical presence of (groups of) friends may generally increase rather than decrease consumption (de Castro 1994; Luo 2005; Zhang and Shrum 2009), mostly due to normative and impression management concerns. The research reported in Chapter 4 showed that the psychological activation of friendship increases a global processing style, arguably because friendship is considered a communal social relationship that is associated with an emphasis on global needs and a general concern for the other person. Note that in cases where normative and impression management concerns are dominant, consumers are likely to be concerned with the behavioral and attitudinal standards that are appropriate at that specific moment. Such a focus on the here and now is generally associated with a local rather than global processing style, reducing rather than facilitating self-control (Fujita et al. 2006; Liberman and Trope 1998). Hence, future research might address the validity of the role of a local processing style in consumption situations where consumers are accompanied by (groups of) friends. Likewise, more research is needed on whether factors like the number of friends present and whether or not the present friends act as 'enactment models' (Hofmann et al. 2011), moderate the impact of friends on consumer self-control.

Finally, future research may examine why the effect of friendship is particularly pronounced for consumers low in self-control. We know from the literature that self-regulatory resource depletion induces a local processing style (Bruyneel and Dewitte 2012; Wan and Agrawal 2011). Moreover, interview studies have revealed that compulsive buyers on a shopping spree tend to focus on concrete features, like the smell, sound and feeling of stimuli in the shopping environment (Friese 2000), suggesting a local processing style (Trope and Liberman 2010). Hence, both types of consumers whose self-control has consistently been shown to benefit significantly from friendship reminders, likely possess local processing styles. This suggests that

it may be a global processing style associated with higher levels of self-control (Fujita et al. 2006) that obviates the role of friendship for non-depleted and non-compulsive consumers. The results of Chapter 4 provide evidence in line with this reasoning, however further research should also take the (chronically local?) processing styles of compulsive versus non-compulsive buyers into account.

5.4 CONCLUSION

In conclusion, the present dissertation shows the beneficial influence of friendship on consumer self-control and is as such of substantial scientific and societal relevance.

Using a multi-method approach comprising behavioral experiments and fMRI, it specifically shows that reminders of friendship improve both sides of the self-control struggle: they reduce the strength of consumption impulses, while enhancing the strength to inhibit these impulses. The effect of friendship turned out to be particularly pronounced for consumers (temporarily or chronically) low in self-control. The following three processes: improved conflict identification, improved control implementation and global processing have been identified as driving the beneficial impact of friendship on consumer self-control.

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Samenvatting (Summary in Dutch)

Een gebrek aan zelfcontrole is een groeiend probleem in onze huidige maatschappij vol met consumptiemogelijkheden (Dittmar 2005; Faber en O'Guinn 1992). Terwijl nog niet zo lang geleden de mogelijkheid om te consumeren beperkt werd door openingstijden, biedt de huidige 24-uurs economie ons de mogelijkheid om op elk willekeurig moment aan consumptie-impulsen toe te geven. Is het niet in een fysieke winkel, dan wel via de computer, tv of smartphone. Het gevolg hiervan is een continue stoom aan consumptieverleidingen (verleidingen om te kopen, ongezond te eten, alcohol te nuttigen, te roken, etc.), welke een serieuze bedreiging vormen voor de zelfcontrole van de consument (Hoch en Loewenstein 1991; Vohs en Faber 2007). Met name voor consumenten met een tijdelijk (ze hebben recent al zelfcontrole uitgeoefend) of chronisch (ze zijn complusieve kopers) lage zelfcontrole, zijn de consumptie-impulsen die deze verleidingen oproepen, moeilijk te weerstaan (Faber en Vohs 2011; Friese, Hofmann, en Wiers 2011; Rook 1987).

Hoewel het toegeven aan consumptie-impulsen niet altijd direct problematische gevolgen heeft, kunnen problemen met het bedwingen van consumptie-impulsen uiteindelijk wel degelijk negatieve consequenties hebben. Zo geven maar liefst vier op de tien Britse vrouwen regelmatig meer geld uit dan zij zich kunnen veroorloven ("Addicted to Shopping" 2009). Schattingen van het aantal mensen dat excessief veel koopt (compulsieve kopers) liggen bovendien rond de 12 procent van de Westerse bevolking (Dittmar, Long, en Bond 2007; Faber en O'Guinn, 1992), en niet minder dan 60 procent van de volwassenen in de Verenigde Staten is zwaarder dan gezond wordt geacht (Centers for Disease Control and Prevention 2010).

In de huidige dissertatie laat ik echter zien dat er hoop is voor consumenten die moeite hebben met het weerstaan van consumptie-impulsen. Concreet toon ik aan dat het herinneren van consumenten aan vriendschap een effectieve methode is om hun zelfcontrole te vergroten.

De grootte van iemands zelfcontrole wordt beschouwd als het product van twee verschillende krachten: aan de ene kant is er de sterkte van consumptie-impulsen (bv. de hevige wens om de brownie te eten die zo verleidelijk op de toonbank van de bakker ligt en 'EET MIJ' lijkt te schreeuwen) en aan de andere kant de kracht om niet aan deze consumptie-impulsen toe te geven (d.w.z. de kracht om consumptie-impulsen te bedwingen; Friese et al. 2011; Schmeichel, Harmon-Jones, en Harmon-Jones 2010). Wanneer beide krachten in evenwicht zijn, is er sprake van zelfcontrole. Wanneer een consumptie-impuls echter sterker is dan het vermogen om deze impuls te bedwingen, leidt dit tot falende zelfcontrole (d.w.z. tot consumptie van bijvoorbeeld de brownie, sigaret of het biertje, of aankoop van dat extra paar schoenen). In het huidige onderzoek laat ik zien dat het herinneren van consumenten aan vriendschap hun zelfcontrole bevordert, doordat het denken aan vriendschap deze beide krachten verbetert: het vermindert de sterkte van consumptie-impulsen en versterkt bovendien de kracht om deze consumptie-impulsen te weerstaan.

In dit proefschrift beschrijf ik negen studies, verdeeld over drie empirische hoofdstukken. De meerderheid van de studies is experimenteel van aard en één studie maakt gebruik van fMRI (functional Magnetic Resonance Imaging). Het huidige onderzoek is daarmee een van de eersten die experimentele onderzoeksmethoden combineert met fMRI, en op die manier inzicht verschaft in zowel waarneembaar gedrag als de onderliggende hersenprocessen van consumenten (Huettel et al. 2009).

In de volgende paragrafen zal ik per hoofdstuk de belangrijkste resultaten beschrijven en ingaan op de wetenschappelijke en maatschappelijke relevantie van de uitkomsten van dit onderzoek.

BELANGRIJKSTE RESULTATEN

In Hoofdstuk 2, het eerste empirische hoofdstuk, identificeer ik vriendschap als een factor die de zelfcontrole van consumenten verbetert. Ik laat zien dat consumenten minder geneigd zijn tot impulsieve aankopen en snoepen wanneer zij herinnerd worden aan vriendschap. Over het algemeen trad dit effect (en ook de effecten die

in de overige hoofdstukken gerapporteerd worden) alleen op bij consumenten die (tijdelijk of chronisch) weinig zelfcontrole hadden en daardoor extra vatbaar waren voor consumptieverleidingen, voordat zij aan vriendschap herinnerd werden. Bij dergelijke consumenten valt immers het meeste te verbeteren wat zelfcontrole betreft. Echter, wanneer consumenten herinnerd werden aan vriendschap door simpelweg de fysieke aanwezigheid van een goede vriendin (in plaats van, bijvoorbeeld, door over vriendschap te schrijven), had vriendschap een positief effect op de zelfcontrole van álle deelnemers.

Naast het aantonen van de heilzame werking van vriendschap op zelfcontrole, ga ik in deze dissertatie uitgebreid in op de onderliggende oorzaken van dit effect. In Hoofdstuk 2 laat ik zien dat vriendschap de zelfcontrole van consumenten verbetert doordat vriendschap de sterkte van consumptie-impulsen verlaagt. Dat wil zeggen, nadat ze aan vriendschap hadden gedacht, evalueerden deelnemers een cupcake, Mars reep en aantrekkelijke kleding minder positief dan wanneer ze niet aan vriendschap hadden gedacht. Minder sterke consumptie-impulsen zijn logischerwijs makkelijker te weerstaan dan sterkere consumptie-impulsen en daarmee verkleinen zij de kans op zelfcontrole-falen (Friese et al. 2011; Schmeichel et al. 2010).

Naast de sterkte van consumptie-impulsen, is, zoals gezegd, ook het vermogen van de consument om consumptie-impulsen te bedwingen van invloed op zijn of haar zelfcontrole (Friese et al. 2011; Schmeichel et al. 2010). In hoofdstuk 3 onderzoek ik wat de invloed van vriendschap is op dit vermogen om zelfcontrole uit te oefenen. Concreet toon ik aan dat vriendschap het vermogen om consumptie-impulsen te weerstaan vergroot, en wel op twee manieren. Ten eerste verbetert het herinneren van consumenten aan vriendschap de capaciteit om zelfcontrole-conflict te identificeren (conflictidentificatie). Dat wil zeggen: het verbetert het vermogen van de consument om vast te stellen of er spanning bestaat tussen enerzijds het toegeven aan consumptie-impulsen en anderzijds het streven naar zelfcontrole. Daarnaast verbetert het herinneren aan vriendschap de capaciteit van de consument om zelfcontrole daadwerkelijk uit te voeren (controle-implementatie). Dit bleek zowel uit daadwerkelijk gedrag (deelnemers konden hun impulsen om te reageren op afbeeldingen van consumptieverleidingen, als kleding en schoenen, beter weerstaan), als uit de hersenactivatie van consumenten in de Anterior Cingulate Cortex (ACC) en Dorsolaterale Prefrontale Cortex (DLPFC). Dit zijn twee hersendelen waarvan herhaaldelijk is aangetoond dat zij van invloed zijn op respectievelijk

conflictidentificatie en controle-implementatie (Botvinick et al. 1999; Hedgcock en Rao 2009; Knoch en Fehr 2007; Liddle, Kiehl, en Smith 2001; MacDonald et al. 2000).

In Hoofdstuk 4 tenslotte, leg ik nog een ander proces bloot dat bijdraagt aan de verklaring voor de positieve invloed van vriendschap op zelfcontrole. In dit hoofdstuk laat ik zien dat bij consumenten met een (tijdelijk of chronisch) lage zelfcontrole, het herinneren aan vriendschap leidt tot een globale verwerkingsstijl. In tegenstelling tot een lokale verwerkingsstijl, waarbij mensen focussen op concrete kenmerken van een product, focussen mensen met een globale verwerkingsstijl op abstracte kenmerken (Trope en Liberman 2010). Deze focus op abstracte kenmerken zorgt er vervolgens voor dat consumenten *niet* focussen op de verleidelijke, veelal concrete kenmerken van consumptieverleidingen (bv. de geur van brownies of het merkje op een spijkerbroek), waardoor zij de consumptieverleidingen beter kunnen weerstaan (Fujita et al. 2006).

WETENSCHAPPELIJKE EN MAATSCHAPPELIJKE RELEVANTIE

Hoewel een tekort aan zelfcontrole erkend wordt als een groeiend probleem in onze huidige consumptiemaatschappij (Baumeister 2002; Dittmar 2005; Rook en Fisher 1995; Vohs en Faber 2007), hebben de meeste onderzoeken naar zelfcontrole zich gericht op factoren die zelfcontrole *verlagen.* Hierdoor is er nog relatief weinig onderzoek gedaan naar factoren die zelfcontrole juist *verbeteren* (Ackerman et al. 2009; Baumeister et al. 2005; Finkel et al. 2006; Rook en Garner 1993; Tice en Bratslavsky 2000; Vohs en Faber 2007) en al helemaal vrijwel geen onderzoek gedaan naar factoren die specifiek de kracht van consumptie-impulsen verminderen (Schmeichel et al. 2010). Ook is nog onvoldoende bekend over de hersenprocessen die betrokken zijn bij effectieve zelfcontrole (Wagner en Heatherton 2011).

In de huidige dissertatie identificeer ik vriendschap als een factor die de zelfcontrole van consumenten verbetert, door zowel de kracht van consumptie-impulsen te verlagen als het vermogen om consumptie-impulsen te bedwingen te vergroten. Tevens werp ik licht op de betrokken hersenprocessen. Door zowel het positieve effect van vriendschap op zelfcontrole te identificeren als de onderliggende (hersen)processen bloot te leggen, is de huidige dissertatie van aanzienlijk wetenschappelijke relevantie.

Naast de wetenschappelijke relevantie van de dissertatie, is het onderzoek ook maatschappelijk relevant. Doordat het herinneren van consumenten aan vriendschap een positief effect heeft op beide krachten die betrokken zijn bij het succesvol uitvoeren van zelfcontrole, voldoet vriendschap aan een belangrijke voorwaarde voor effectieve interventies tegen falende zelfcontrole (Friese et al. 2011). Objecten, personen of situaties die aan vriendschap herinneren, kunnen daardoor worden ingezet bij therapieën tegen fenomenen waar problemen met het bedwingen van consumptie-impulsen aan ten grondslag liggen. Denk hierbij aan compulsief koopgedrag, obesitas of overmatige alcoholconsumptie. Een concreet voorbeeld zou kunnen zijn om consumenten die te veel kopen te adviseren een foto van een goede vriend(in) in hun portemonnee te plaatsen. Op die manier, worden zij telkens wanneer zij de fout in dreigen te gaan herinnerd aan een hechte vriendschap, waardoor hun zelfcontrole een oppepper krijgt.

Hierbij moet worden opgemerkt dat in deze dissertatie situaties onderzocht zijn waarin deelnemers aan vriendschap werden herinnerd door over vriendschap te schrijven, te vertellen, aan de aanwezigheid van een vriendin te denken of door middel van de fysieke aanwezigheid van een vriendin. In alle gevallen was de vriend(in) niet zelf aan het consumeren (eten of kopen) in de consumptiesituatie. Het denken aan of de fysieke aanwezigheid van een vriend(in) die op dat moment zelf consumeert zou wellicht een ander effect kunnen hebben dan het herinneren aan vriendschap en als zodanig een ander effect op zelfcontrole kunnen hebben.

Samenvattend toont deze dissertatie aan dat het herinneren van consumenten met een (tijdelijk of chronisch) lage zelfcontrole aan vriendschap, hun zelfcontrole bevordert. Daarmee lijken The Beatles gelijk te hebben gehad toen zij zongen: *"I get by with a little help from my friends"* (Lennon en McCartney 1967).